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SONY XBR-55X900H SERVICE MANUAL

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SERVICE MANUAL (COMMON)

ORIGINAL MANUAL ISSUE DATE: 2020.03

(See next page for revision)

GN6UR CHASSIS
Segment: NX/NXB

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LCD TV

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REVISION HISTORY

Version	Date	Subject
1	2020.03	1st Issue
2	2020.06	Add software update info (pg. 95)

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MODEL LISTS

THIS SERVICE MANUAL CONTAINS **COMMON INFORMATION** FOR BELOW REGIONS AND MODELS:

REGION

AMERICA CHINA ASIA EUROPE JAPAN

MODEL

XBR-55X900H	XBR-65X900H	XBR-75X900H	XBR-85X900H
KD-55X9000H	KD-65X9000H	KD-75X9000H	KD-85X9000H
KD-55XH9005	KM-65X9000H	KD-75XH9005	KM-85X9000H
KM-55X9000H	KD-65XH9005	KM-75X9000H	KD-85XH9096
FW-55BZ40H	FW-65BZ40H	FW-75BZ40H	FW-85BZ40H

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Please refer Service Manual – Unique for below information :

- Disassembly and Removal Caution
- Wire Dressing
- Circuit Board Location
- Exploded Views and Part Lists

Note: Pictures provided in this manual may have difference from actual sets

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SECTION 1
SAFETY NOTES

1-1. Warnings and Caution

1)CAUTION :These servicing instructions are for use by qualified service personnel only.

2)To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.

3)WARNING!! : An isolation transformer should be used during any service to avoid possible shock hazard, because of live chassis. The chassis of this receiver is directly connected to the ac power line.

The replaceable fuse could be in the neutral of the mains supply. When replacing the fuse, the mains shall be disconnected for de-energize the phase conductors.

(*Except AC ADAPTOR, Because it does not carry out replacing an internal fuse.)

4) CARRYING THE TV : Be sure to follow these guidelines to protect your property and avoid causing serious injury :

• Carry the TV with an adequate number of people; larger size TVs require two or more people.

•Correct hand placement while carrying the TV is very important for safety and to avoid damages.

5) SAFETY-RELATED COMPONENT WARNING!! : Components identified by shading and ! mark on the exploded views, and in the parts list are critical for safe operation. Replace these components with Sony parts whose part numbers appear as shown in this manual or in supplements published by Sony. Circuit adjustments that are critical for safe operation are identified in this manual. Follow these procedures whenever critical components are replaced or improper operation is suspected.

6) IMPORTANT REMINDER FOR TV MAINBOARD REPLACEMENT :

It is mandatory for service centers to confirm the TV's system information after each repair carried out with Mainboard replacement.

Whenever a TV Main board is replaced, the correct TV Model and Serial number must be reinserted into memory.

This is a MANDATORY procedure that each service center must apply.

Please refer to the chapter of ADJUSTMENT in this service manual to find out how to set the model number and serial number in service mode.

1-2-1. Caution Handling of LCD Panel

When repairing the LCD Panel, make sure you are grounded with a wrist band.
When repairing the LCD Panel on the wall, the panel must be secured using the 4 mounting holes on the rear cover.

1) Do not press the panel or frame edge to avoid the risk of electric shock.

2) Do not scratch or press on the panel with any sharp objects.

3) Do not leave the module in high temperature or in areas of high humidity for an extended period of time.

4) Do not expose the LCD panel to direct sunlight.

5) Avoid contact with water. It may cause short circuit within the module.

6) Disconnect the AC power when replacing the backlight (CCFL) or inverter circuit. (High voltage occurs at the inverter circuit at 650Vrms)

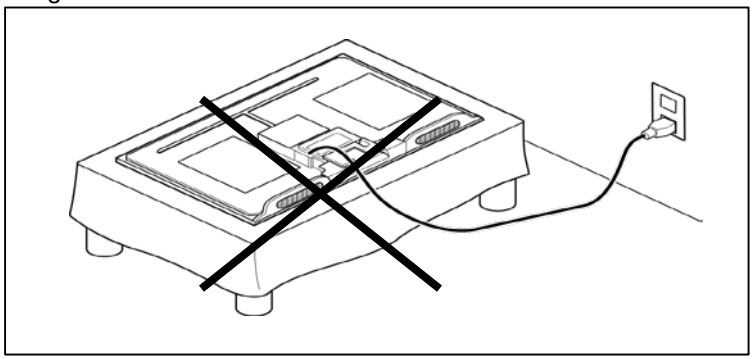
7) Always clean the LCD panel with a soft cloth material.

8) Use care when handling the wires or connectors of the inverter circuit. Damaging the wires may cause a short circuit.

9) Protect the panel from ESD to avoid damaging the electronic circuit (C-MOS).

10) During the repair, DO NOT leave the Power On or Burn-in period for more than 1 hour while the TV is face down on a cloth. Refer Figure 1

Figure 1.



1-2-2. Caution for OLED Panel

1) Handling

When repairing the TV set, be sure you are grounded by using a wrist band.

*Do not press on the panel or frame edge to avoid the risk of electric shock.

*Do not scratch or press on the panel with any sharp objects.

*Do not leave the module in high temperatures or in areas of high humidity for an extended period of time.

*Do not expose the panel to direct sunlight.

*Avoid contact with water. It may cause a short circuit within the module.

*Disconnect the AC power when replacing.

*Always clean the panel with a soft cloth material.

*Use care when handling the wires or connectors. Damaging the wires may cause a short.

*Protect the panel from ESD to avoid damaging the electronic circuit.

*Do not recommend power-on in the conditions which laid face down the panel, in repair activity. Refer Figure 1.

*When transporting by hand, do not put stress on the panel and the frame around the screen.

Refer to the panel handling chapter of each Service manual, or the "Transporting" information of the Reference Guide of each model for how to hold it.

2) OLED Screen

•Although the OLED screen is made with high-precision technology and 99.99% or more of the pixels are effective, black dots may appear or bright points of light (white, red, blue, or green) may appear constantly on the OLED screen. This is a structural property of the OLED screen and is not a malfunction.
•Do not push or scratch the front filter, or place objects on top of this TV set. The image may be uneven or the OLED screen may be damaged.
•The screen and cabinet get warm when this TV set is in use. This is not a malfunction.

3) Precautions to Protect the Screen from Damage

Image retention

OLED TV's are susceptible to image retention (burn-in) due to the characteristics of the materials used. Image retention may occur if images are displayed in the same location on the screen repeatedly or over extended periods of time. This is not a malfunction of the TV. Avoid displaying images that may cause image retention.

The following are examples of images that may cause image retention:

•Content with black bars either on the top and bottom and/or the left and right sides of the screen. (for example, Letterboxed, 4:3 screen, Standard definition)
•Static images such as photos.
•Video games that might have static content in some part of the screen.
•On-screen menus, program guides, channel logos etc.
•Static content from applications.
•On-screen tickers, such as those used for news and headlines.

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To reduce the risk of image retention:
•Fill the screen by changing [Wide mode] to eliminate the black bars. Select [Wide mode] other than [Normal].
•Turn off the OSD (On Screen Display) by pressing the DISPLAY button, and turn off the menus from connected equipment. For details, refer to the instruction manuals for the connected equipment.
•Avoid displaying static images with bright colours (including white), clocks or logos on any portion of the screen.
•Set the picture settings based on the ambient conditions. The Standard Picture is recommended for home use and when viewing content that often displays the station logos, etc.
The TV has following features to help reduce/ prevent image retention.
Press the HOME button, then select [Settings] – [Picture & Display] – [Expert panel settings] – the desired option.

Panel refresh
Panel refresh will automatically run to adjust the uniformity of the TV screen after it has been in use for long periods of time.
Panel refresh can also be performed manually and should only be used if image retention is very noticeable or you see the following message: [Panel refresh did not finish...]

Caution:
•The Panel refresh function may affect the panel. As a reference, perform the Panel refresh only once a year, do not perform it more than once a year as it may affect the usable life of the panel.
•Panel refresh takes about one hour to complete.
•A white line may be displayed on the screen during the Panel refresh, this is not a malfunction of the TV.
•Panel refresh will only work when the room temperature is between 10 ºC and 40 ºC.

Pixel shift
Automatically moves the image on the screen to prevent image retention.

Other feature
The screen brightness is automatically reduced when displaying still images, clocks, bright colours or logos etc.

IMPORTANT REMINDER FOR OLED PANEL REPLACEMENT
When carrying out OLED panel replacement, it is mandatory of a service center to confirm and record Panel ON time & Panel Refresh times.
It is because they are indispensable information in order to clarify responsibility for image retention after panel replacement.
Please refer to the chapter of SELF DIAGNOSIS FUNCTION in this service manual to find out how to confirm the Panel ON time & Panel Refresh times in service mode.

1-3. Caution for board handling

Symptom : The following problems will occur due to handling of the IC mounted on the board

- ・Solder crack due to substrate handling (stress)
- ・IC breakdown due to static electricity (ESD)

When repairing the TV at the customer‘s home or service station or Repair of defect board, please pay attention to the handling of the board

※Substrate that needs attention for handling
・Main Board（B** - Board）
・Backend Board（D** - Board）

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SAFETY NOTES

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※Things to prepare in advance

ESD wrist-strap

ESD cushion/sheet

Please use a bag containing the board or a special seat

ESD wrist-strap to be checked daily.
Use Multi-meter to make sure resistance of ESD wrist-strap is OK.
(R=750K Ohms to 35Mega Ohms)

1) Caution for Board handling(Stress)
Be sure to observe the following contents.

① Hold the board with both hands

② Do not hold/push Heat-Sink

③ Handle with care. Do not swing.

SECTION 1
SAFETY NOTES

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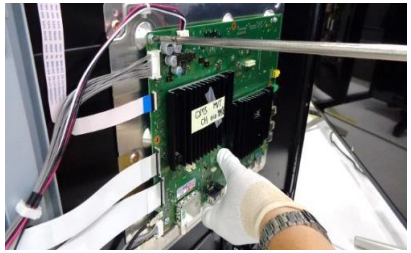
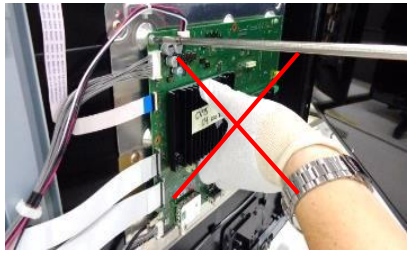
④Regardless of Good board or Defective board, always put it on ESD cushion/sheet slowly.

⑤Do not stack up

⑥Keep vertical position and put in/take out from Box.
Always put in to ESD bag then place into Box/Container Box.

⑦Do not hold Heat-Sink when take out or install it..





2) Caution for Board handling(ESD)
Be sure to observe the following contents.

①When take off Rear-Cover, do not touch to board	②Use ESD wrist-strap

SECTION 1
SAFETY NOTES

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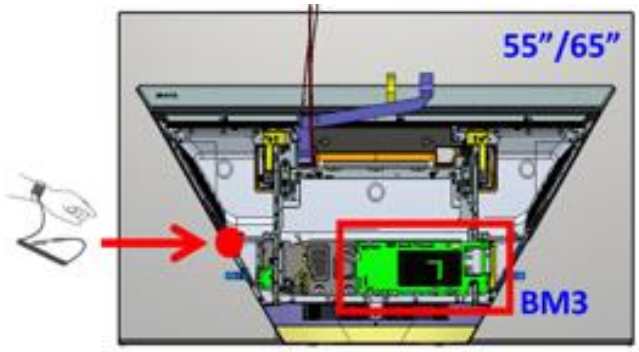
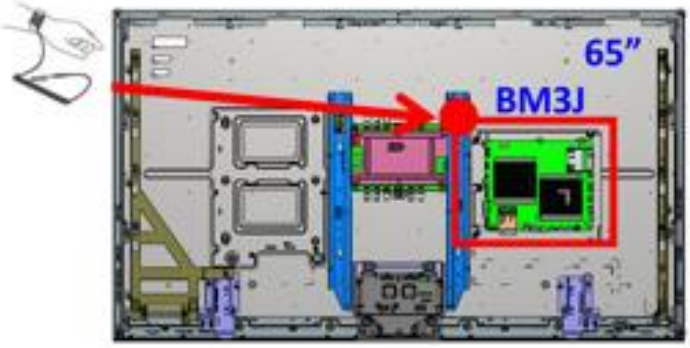
※Installation example of wrist-strap
Please connect the clip to the metal part of the chassis of the TV with the wristband grounded. Below is a grounding example of each model.

＜K*-55/65A9F＞



＜K*-65Z9F＞



※Caution
ESD wrist-strap to be checked daily.
Use Multi-meter to make sure resistance of ESD wrist-strap is OK.(R=750K Ohms to 35Mega Ohms)

③When holding board, do not hit/touch to Plastic part(s)

④After take defective board out from TV, put it into ESD bag.
Do not place on floor mat/carpet direct. And, always put it on ESD cushion

SECTION 1
SAFETY NOTES

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1-4. Caution About the Lithium Battery

1) Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type.
2) Outer case broken battery should not contact to water.

1-5. Safety Check-Out

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:-

1)Check the area of your repair for unsoldered or poorly soldered connections. Check the entire board surface for solder splashes and bridges.

2)Check the inter board wiring to ensure that no wires are pinched or contact high-wattage resistors.

3)Check all control knobs, shields, covers, ground straps and mounting hardware have been replaced. Be absolutely certain you have replaced all the insulators.

4) Look for unauthorized replacement parts, particularly transistors that were installed during a previous repair. Point them out to the customer and recommend their replacement.

5) Look for parts which, though functioning show obvious signs of deterioration. Point them out to the customer and recommend their replacement.

6) Check the line cords for cracks and abrasion. Recommend the replacement of any such line cord to the customer.

7) Check the antenna terminals, metal trim, metalized knobs, screws and all other exposed metal parts for AC leakage. Check leakage test as described next.

8. For safety reasons, repairing the Power board and/or Inverter board is prohibited.

1-6. Leakage Test

(To protect electric shock when customer touch the terminal.)
Leakage current can be measured by V: Voltmeter or oscilloscope (r.m.s. or peak reading)

Stabilized power supply instrument and isolated voltage transformer: Use too much current capacity and isolated voltage transformer does not need to use stabilized power supply equipment.
Specification of RMS volt meter: Input resistance > 1 Mohm, Input capacitance < 200 pF, Frequency range: 15 Hz – 1MHz . Refer Figure 2. Isolated type volt -meter (FLUKE 8921A etc *1)
*1 Not use FLUKE 8920A that connected to protective earth by diode
Leakage current of measurement instrument is less than 10μArms when under test equipment AC plug is opened
Set up the following condition and turn on the set. Applied voltage: Nominal input voltage (Description on Nameplate)
Measure the leakage current between one phase conductor and neutral for terminal A and terminal B.
Read rms value, and then calculate to peak value PEAK VALUE =√2 RMS VALUE

Comply with the following requirement
Class II equipment (2-pin plug): for each terminal, the worst value of measurement must not exceed AC 350uA peak).
Note: including AC adaptor, AC adaptor/DC operated unit combination

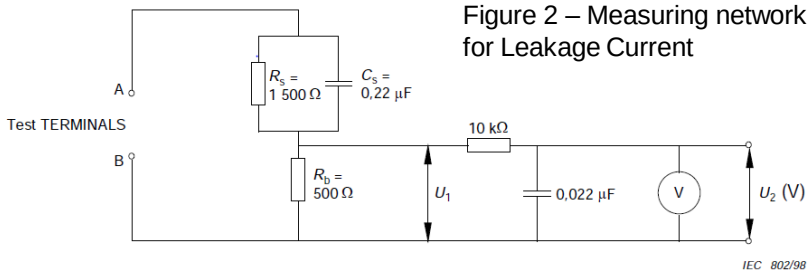

Figure 2 – Measuring network for Leakage Current

1-7. How to Find a Good Earth Ground

1)A cold-water pipe is a guaranteed earth ground; the cover-plate retaining screw on most AC outlet boxes is also at earth ground.
2)If the retaining screw is to be used as your earth ground, verify that it is at ground by measuring the resistance between it and a cold-water pipe with an ohmmeter. The reading should be zero ohms.
3)If a cold-water pipe is not accessible, connect a 60- to 100-watt trouble-light (not a neon lamp) between the hot side of the receptacle and the retaining screw. Try both slots, if necessary, to locate the hot side on the line; the lamp should light at normal brilliance if the screw is at ground potential (see Figure 3).

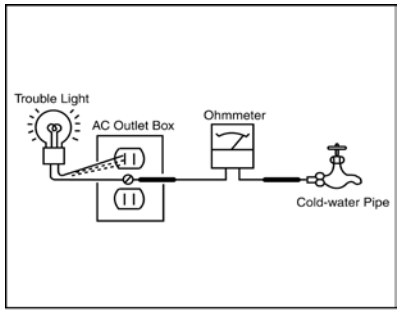

Figure B. Checking for earth ground.

Figure 3. Checking for earth ground.

1-8. Lead Free Information

The circuit boards used in these models have been processed using Lead Free Solder. The boards are identified by the LF logo located close to the board designation.

Figure 4: LF Logo

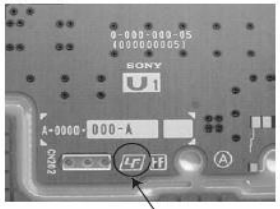

Figure 5: LF logo on circuit board

The servicing of these boards requires special precautions. It is strongly recommended to use Lead Free Solder material in order to guarantee optimal quality of new solder joints.

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SECTION 2
SELF DIAGNOSTIC FUNCTION

The units in this manual contain a self-diagnostic function. If an error occurs, the Smart Core Red LED will automatically begin to flash. The number of times the LED flashes translates to a probable source of the problem.

A definition of the Smart Core Red LED flash indicators is listed in the instruction manual for the user's knowledge and reference.
If an error symptom cannot be reproduced, the remote commander can be used to review the failure occurrence data stored in memory to reveal past problems and how often these problems occur.

DIAGNOSTIC TEST INDICATORS
When an error occurs, the Smart Core Red LED will flash a set number of times to indicate the possible cause of the problem. If there is more than one error, the LED will identify the first of the problem areas.
Result for all of the following diagnostic items are displayed on screen. If the screen displays a "0", no error has occurred .

For China Models :
Please use FY19 remote (or older) to enter to Service Mode.

Self Diag. Quick Reference (LED blinking)

Smart Core RED LED blinking count	NX/NXB
2x	<B/G> Main 12V over voltage [MAIN_POWER]
3x	<B/G> Main 5.0V failure [DC_ALERT]
	<B/S/G> Audio amp. protection [AUD_ERR]
4x	<P/LD/B/G> LED driver failure/LED voltage protection [LD_ERR] <LD/P/B>*Error detection of the I2C communication between the Main device and the LD IC.[BCM_ERR]*
5x	<P/T/G/B> *Panel ID EEPROM I2C No ACK* *(Also panel power failure is a suspect) [P_ID_ERR]*
6x	<P/G/B> Backlight failure [BACKLIGHT_ERR]
7x	<P/B> Over temperature protection [TEMP_ERR]
8x	-

Blue italic: detect at startup sequence only.
<G>: Power supply board,
<B>: Main board,
<T>: T-con board,
<LD>: LD board
<P>: Panel module,
<S>: Speaker

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SECTION 2
SELF DIAGNOSTIC FUNCTION

Self Diagnosis Quick Reference (Not LED blinking [Record Only])

Error Item	NX/NXB
TU_DEMOD	-
TCON ERR	<T> T-CON device I2C communication failure
AUD_ERR_I2C	<B> Audio amp I2C communication failure
TEMP_ERR_I2C	<B/H> Temp sensor I2C communication failure
TU_DEMOD_I2C	<B> Tuner & Demodulator I2C communication failure
EARC_ERR_I2C	-
8KBE_COM_ERR	-
8KSHV_ERR	-
AMB_ERR_I2C	-

<B>: Main board, <T>: T-con board, <H>: LED, IR & sensor board

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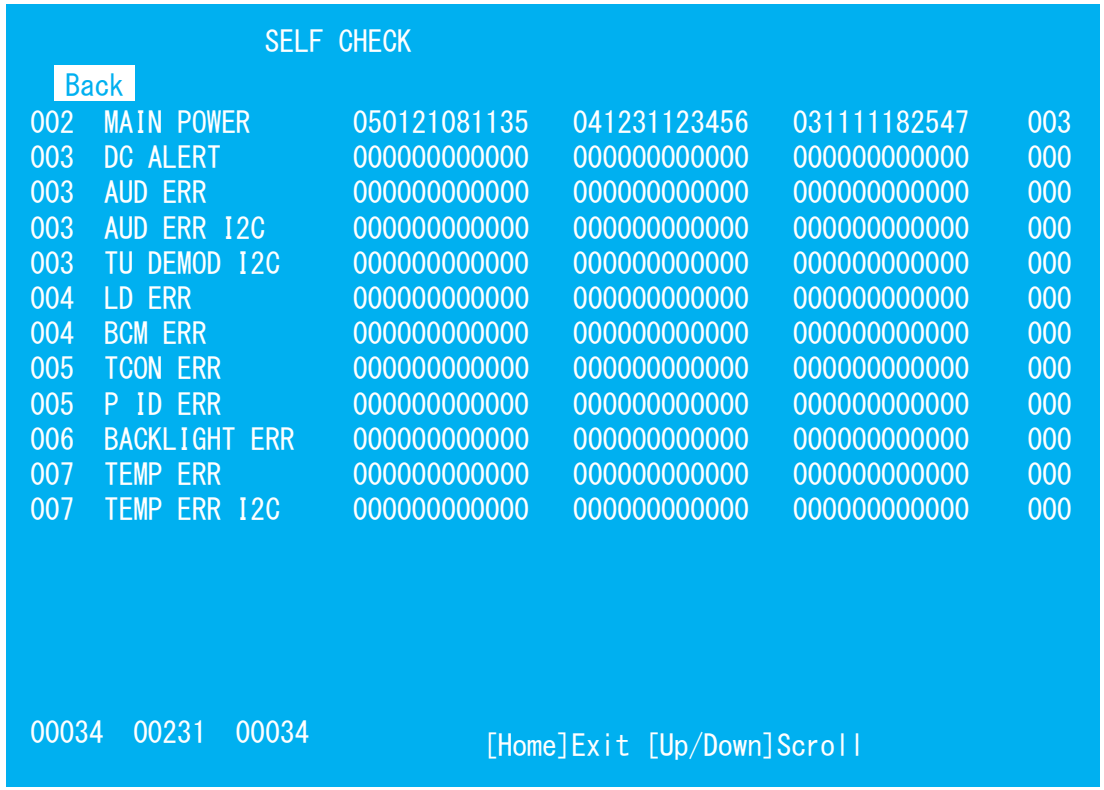
SECTION 2
SELF DIAGNOSTIC FUNCTION

Self Diagnosis Service Menu

Entry (Self Diagnosis Display)
- Go to the standby by a remote.
- Push the buttons sequentially:
  <Display> <5> <Vol-> <Power>.

Exit
- If you want to finish service mode app, do **AC OFF/ON**.
  →*Service mode app is disable perfectly.
- If you want to move home menu, push <HOME> button.
  →*Service mode app do background (not disable perfectly).

Self Diagnosis Display



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Retry Limitation by Remote/Power Key

Smart Core Red LED blinking count	Error Name	Retry Permission Times *1	Note
2x	MAIN_POWER	STDWN_RTRY_LIMIT_MAINPOWR = 1	
3x	DC_ALERT (5V)	STDWN_RTRY_LIMIT = 2	
	AUD_ERR	STDWN_RTRY_LIMIT = 2	
4x	LD_ERR	STDWN_RTRY_LIMIT = 2	
	BCM_ERR	STDWN_RTRY_LIMIT = 2	
5x	P_ID_ERR	STDWN_RTRY_LIMIT = 2	
6x	BACKLIGHT	STDWN_RTRY_LIMIT = 2	
7x	TEMP_ERR	STDWN_RTRY_LIMIT = 2	
8x	4KBE_ERR	STDWN_RTRY_LIMIT = 2	

→ Number of off/on action for MAIN_POWER shutdown is recorded to STDWN_OFFON_CNT_MAIN_POWER.

Number of off/on action during the error shutdown is recorded to STDWN_OFFON_CNT.

*1) If STDWN_OFFON_CNT <= STDWN_RTRY_LIMIT, and STDWN_OFFON_CNT_MAIN_POWER <= STDWN_RTRY_LIMIT_MAINPOWR, you can turn the set on by a remote/power key. At this time, if the error occurs again, the STDWN_OFFON_CNT is incremented by 1.
*2) When the main micon operates normally for STDWN_OFFON_CLR = 60 minutes, STDWN_OFFON_CNT and STDWN_OFFON_CNT_MAIN_POWER are cleared.

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Triage Chart

Sony KD-* Technical Triage Summary Sheet

Before you make the service call…

1. Confirm the symptom from the customer.
2. Select that symptom from the chart.
3. Bring all the boards and cables listed for that symptom.
4. Follow the troubleshooting charts in the technical guides to isolate the board.
5. Chart Color Code

RED DOT: Most likely defective part
BLUE TRIANGLE: Secondary possible defective part
GREEN SQUARE: Tertiary possible defective part
BLACK TEXT: Board that may correct the symptom

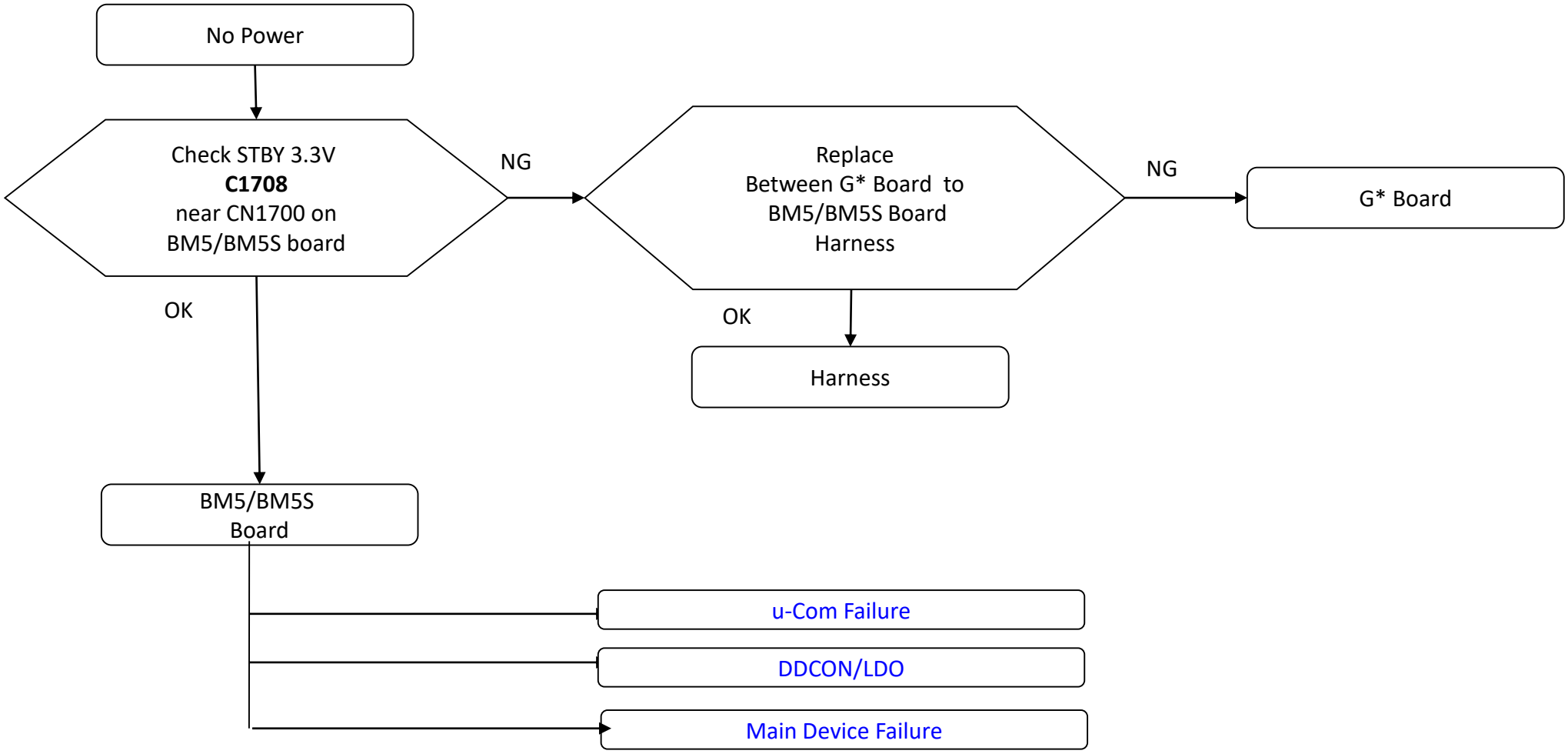
CHASSIS: NX/NXB

LAST UPDATED: 2020/1/30

Reference	Symptoms - Shutdown. Power LED blinking red diagnostics sequences							Symptoms - no shutdown Error log record only								No Power	Video - missing or distorted				Remote	Network	Audio	Smart Core	Bluetooth (BT)
	2	3	4	5	6	7	8	TU_DEMOD	TU_DEMOD_I2C	TCON_ERR	FRCTC_I2C	AUD_ERR_I2C	4KPQ_ERR_I2C	TEMP_ERR_I2C	EARC_ERR_I2C	AMB_ERR_I2C	No White Power LED & does not reponse to remote (Dead Set)	Stationary colored lines or dots	No video One of Inputs	NO RF input	No video all Inputs	No Remote	Cannot connect to Wireless Network	No Audio	Smart Core no LED (Set is still alive)	Bluetooth / One Step Remote (OSR) can't connect
B* Board	▲	●	■	■	■	●			●	▲		●		▲			▲	▲	●	●	●	▲	▲	●	▲	▲
G* Board	●	▲	■	■	■												●				▲			▲		
H* Board														●			▲					●			●	
Speaker		▲																						●		
Wifi & BT Module																							●			●
LD* Board			▲		▲																▲					
V By One FFC				▲						▲								▲			▲					
Tcon				●						●								▲			■					
LCD Panel			●	▲	●	▲				■								●			■					
Problem	Power	Power Audio	Panel LD	Panel (Communication) Tcon	Panel (Backlight)	TEMP	4KBE																			

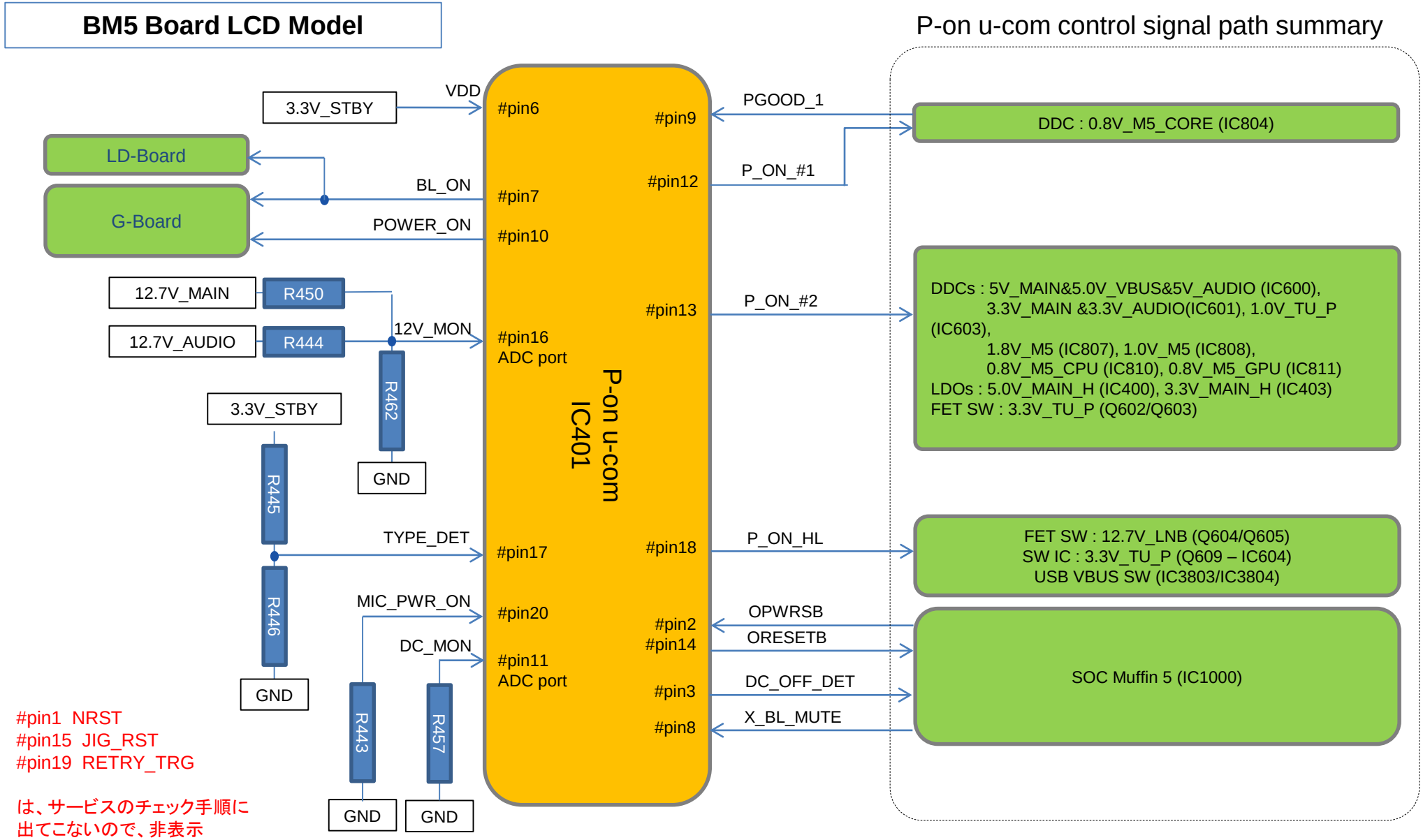
1.0 No power

BM5/BM5S Board Model



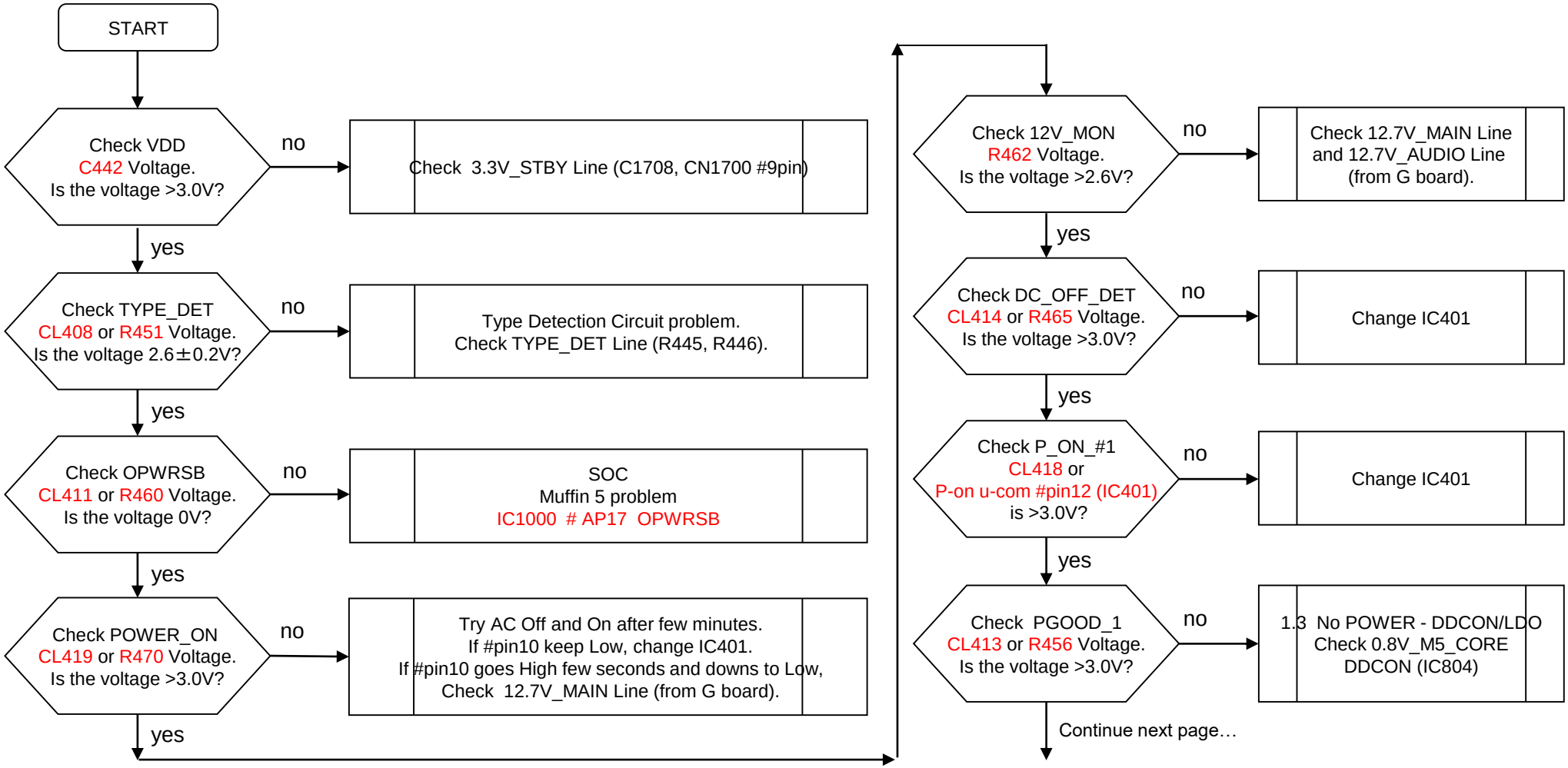
1.2 No Power u-com Failure

BM5 Board LCD Model



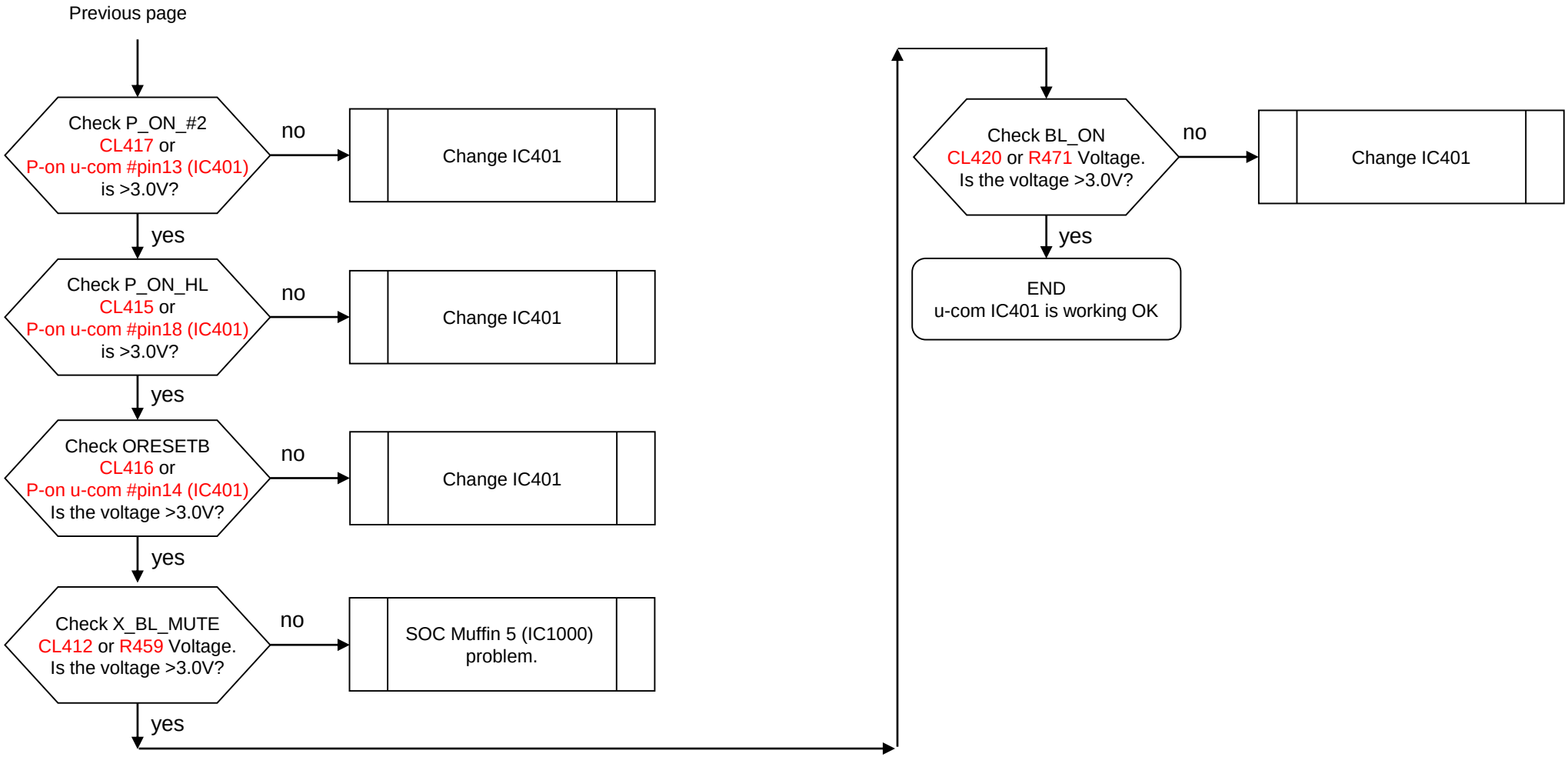
1.2 No Power u-com Failure

BM5 Board LCD Model



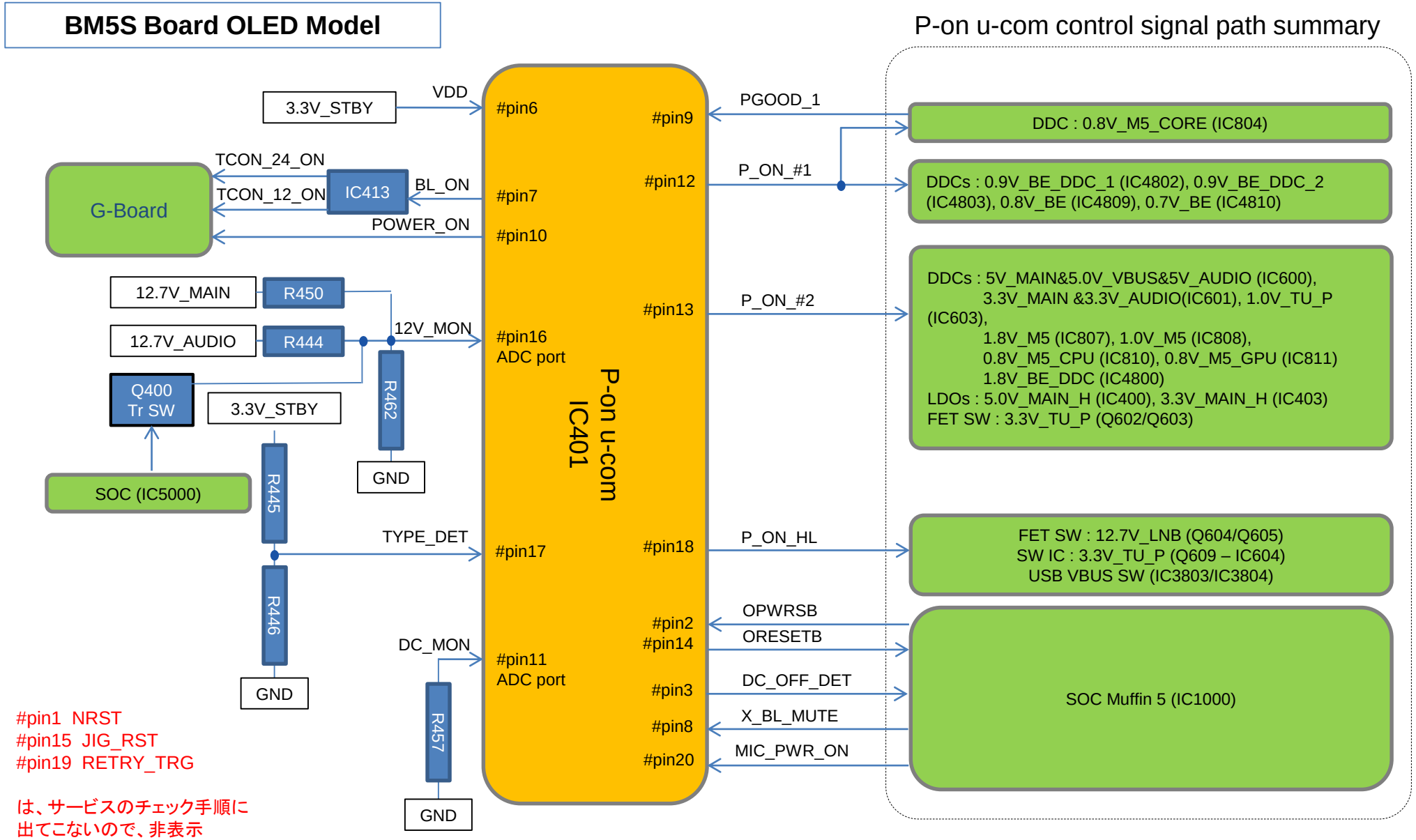
1.2 No Power u-com Failure

BM5 Board LCD Model



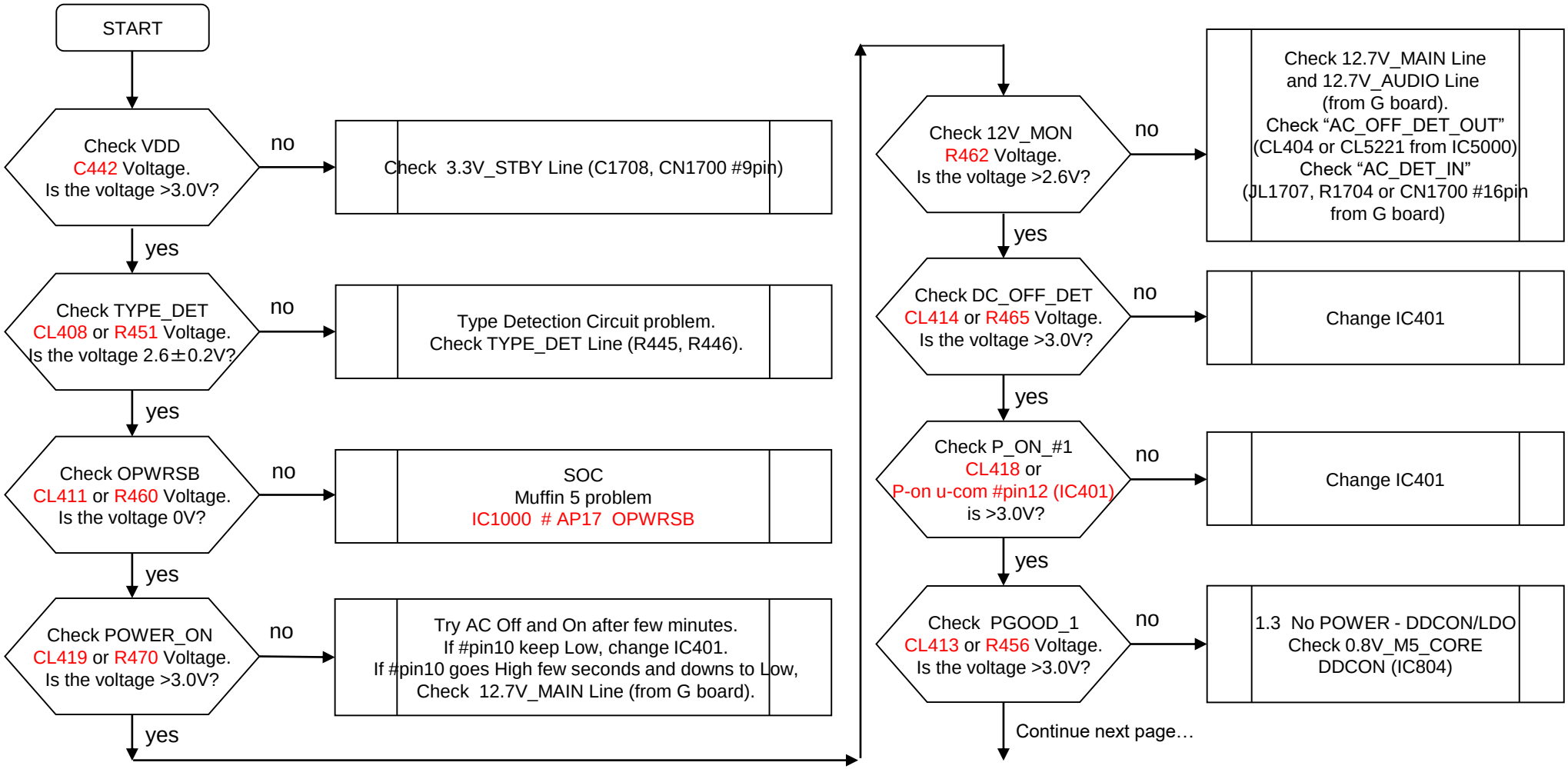
1.2 No Power u-com Failure

BM5S Board OLED Model



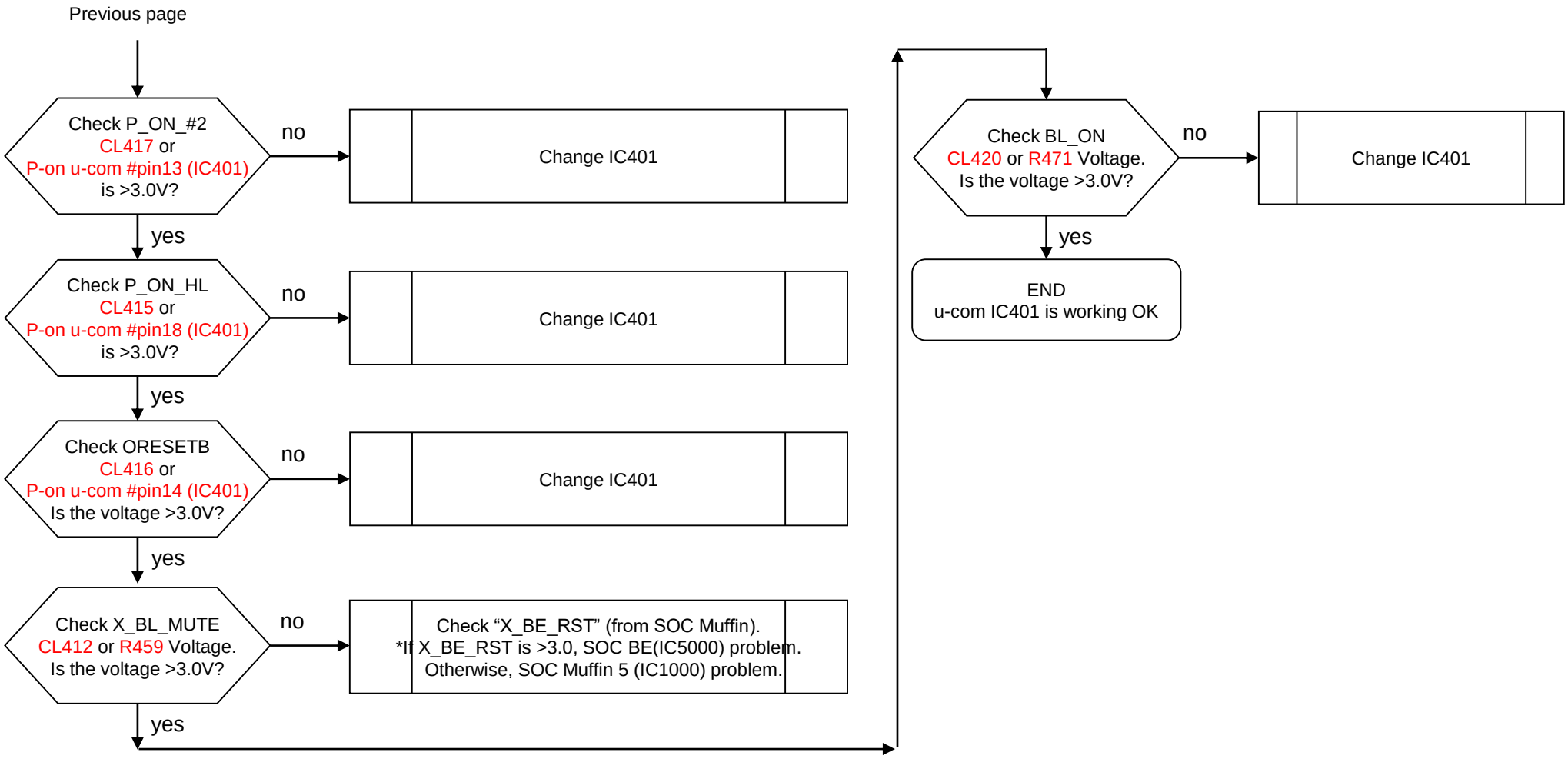
1.2 No Power u-com Failure

BM5S Board OLED Model



1.2 No Power u-com Failure

BM5S Board OLED Model



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1.3 No Power DDCON/LDO

BM5 and BM5S Board Model

Checking item summary

Board	Operation	IC Ref	Voltage supply	Output ref.	Enable pin	Enable source	Fuse	Vcc ref.
BM5/BM5S	LDO	IC400	5.0V_MAIN_H	C414/CL400	R408(shorted)	P_ON_#2	F400	C413
BM5/BM5S	LDO	IC403	3.3V_MAIN_H	C416/CL402	R413(shorted)	P_ON_#2	-	C415
BM5/BM5S	DC/DC	IC600	5V_MAIN/5V_AUDIO	C610/JL601	R600(shorted)/CL604	P_ON_#2	F600	C601
BM5/BM5S	DC/DC	IC601	3.3V_MAIN/3.3V_AUDIO	C619/JL603	R610(shorted)/CL605	P_ON_#2	F601	C618
BM5/BM5S	DC/DC	IC603	1.0V_TU_P	C630/CL607	R631(shorted)/JL607	P_ON_#2 or IC1000 #AL18 (EWS_PWR_ON)	-	C628
BM5/BM5S	DC/DC	IC801	1.1V_M5_DDR	C806/JL801	R913(shorted)	R804/R907 (3.3V_STBY)	-	C801/CL819
BM5/BM5S	DC/DC	IC802	0.9V_M5_STBY	C809/CL803	R908(shorted)	R804/R907 (3.3V_STBY)	-	C807/CL822
BM5/BM5S	DC/DC	IC803	1.8V_STBY	C812/CL811	R822(shorted)	R804 (3.3V_STBY)	-	C810/CL824
BM5/BM5S	DC/DC	IC804	0.8V_M5_CORE	C846/JL803	R849(shorted)/CL816	P_ON_#1	F802	C831
BM5/BM5S	LDO	IC806	1.8V_M5_ET_STBY	C818/JL808	R832(shorted)	IC1000 #AN19 (ETHER_PWR_EN)	-	C817/CL826
BM5/BM5S	DC/DC	IC807	1.8V_M5	C823/JL811	R833(shorted)/CL827	P_ON_#2	F800	C822
BM5/BM5S	DC/DC	IC808	1.0V_M5	C829/JL813	R839(shorted)/CL828	P_ON_#2	F801	C828
BM5/BM5S	LDO	IC809	3.3V_M5_STBY	C816/CL831	R917	R917(3.3V_STBY)	-	C815
BM5/BM5S	DC/DC	IC810	0.8V_M5_CPU	C861/JL816	R914/CL829	P_ON_#2	F803	C855
BM5/BM5S	DC/DC	IC811	0.8V_M5_GPU	C874/JL818	R915/CL830	P_ON_#2	F804	C868

P_ON_#1 : P-on u-com IC401 #pin12
P_ON_#2 : P-on u-com IC401 #pin13

1.3 No Power DDCON/LDO

BM5S Board Model

Checking item summary

Board	Operation	IC Ref	Voltage supply	Output ref.	Enable pin	Enable source	Fuse	Vcc ref.
BM5S	DC/DC	IC4800	1.8V_BE_DDC	C4805/JL4801	R4801(shorted)/CL4816	P_ON_#2	F4800	C4803
BM5S	DC/DC	IC4801	1.1V_BE	C4813/JL4803	R4809(shorted)/CL4817	P_ON_#2	F4801	C4812
BM5S	DC/DC	IC4802	0.9V_BE_DDC_1	C4820/JL4805	R4819(shorted)/CL4818	P_ON_#1	F4802	C4819
BM5S	DC/DC	IC4803	0.9V_BE_DDC_2	C4828/JL4807	R4827(shorted)/CL4819	P_ON_#1	F4803	C4827
BM5S	DC/DC	IC4809	0.8V_BE	C4860/JL4819	R4849(shorted)/CL4808	P_ON_#1	F4804	C4845
BM5S	DC/DC	IC4810	0.7V_BE	C4878/JL4821	R4865(shorted)/CL4811	P_ON_#1	F4805	C4863

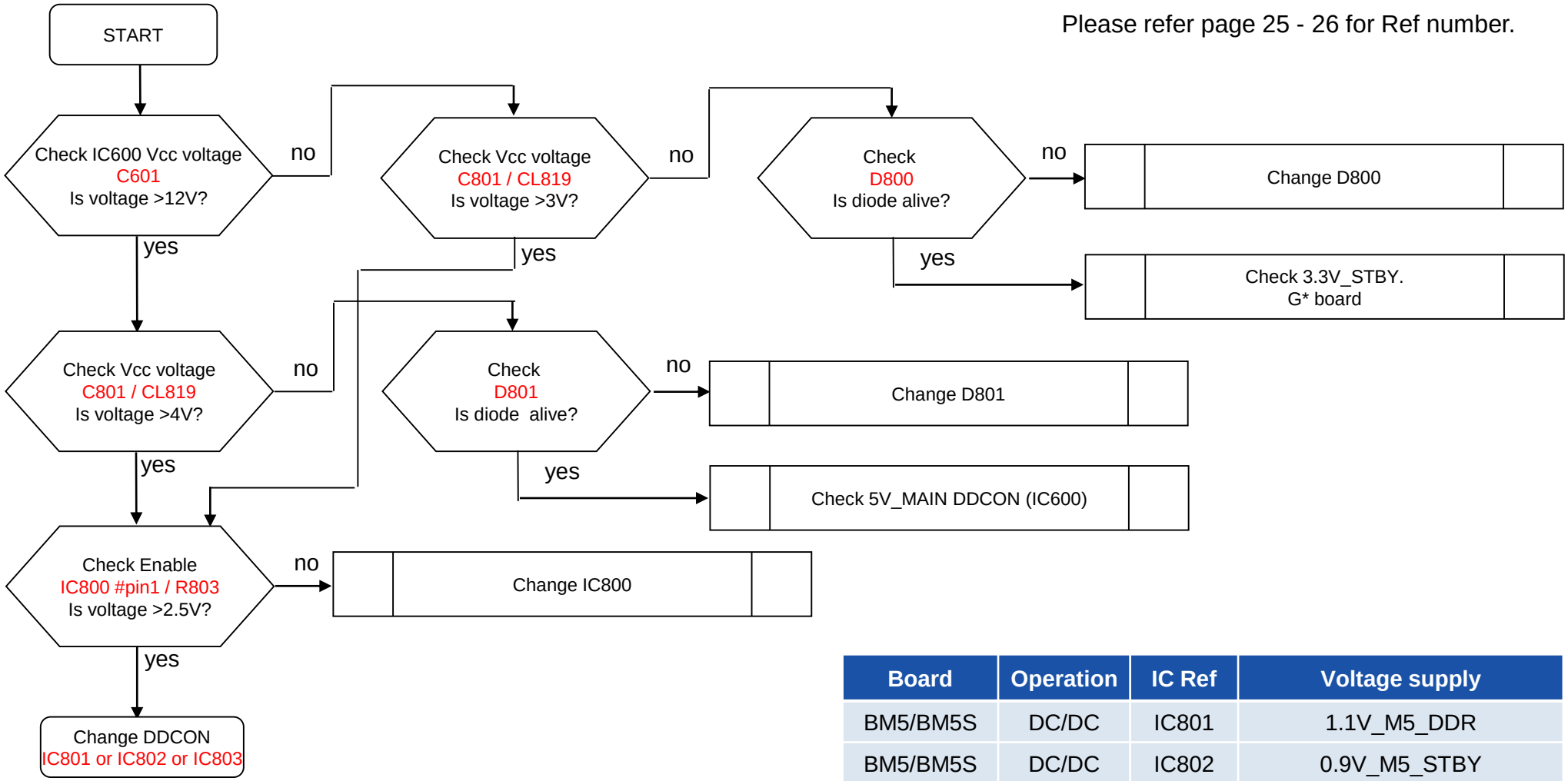
P_ON_#1 : P-on u-com IC401 #pin12
P_ON_#2 : P-on u-com IC401 #pin13

1.3 No Power DDCON/LDO

BM5 and BM5S Board Model

DDCONs check

Please refer page 25 - 26 for Ref number.



Board	Operation	IC Ref	Voltage supply
BM5/BM5S	DC/DC	IC801	1.1V_M5_DDR
BM5/BM5S	DC/DC	IC802	0.9V_M5_STBY
BM5/BM5S	DC/DC	IC803	1.8V_STBY

1.3 No Power DDCON/LDO

BM5 and BM5S Board Model

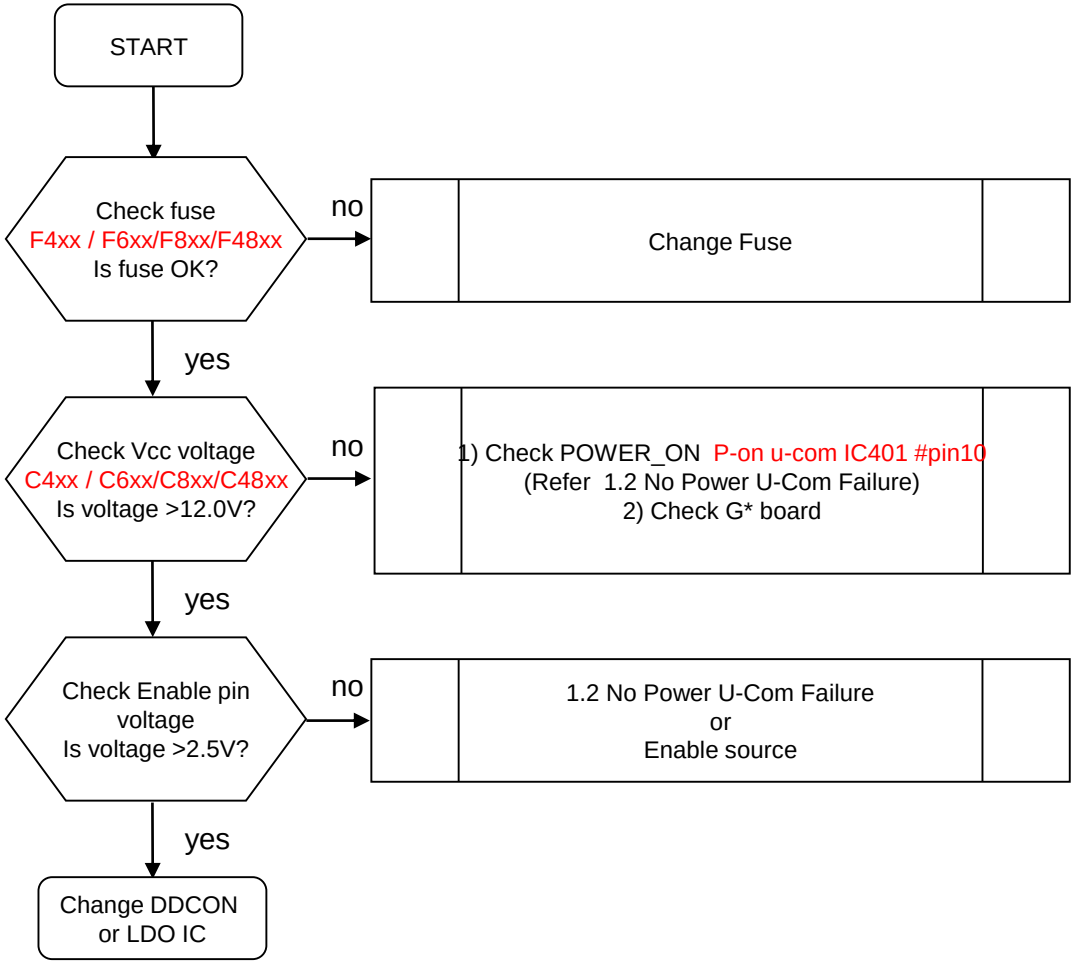
Board	Operation	IC Ref	Voltage supply
BM5/BM5S	LDO	IC400	5.0V_MAIN_H
BM5/BM5S	DC/DC	IC600	5V_MAIN/5V_AUDIO
BM5/BM5S	DC/DC	IC601	3.3V_MAIN/3.3V_AUDIO
BM5/BM5S	DC/DC	IC603	1.0V_TU_P
BM5/BM5S	DC/DC	IC804	0.8V_M5_CORE
BM5/BM5S	DC/DC	IC807	1.8V_M5
BM5/BM5S	DC/DC	IC808	1.0V_M5
BM5/BM5S	DC/DC	IC810	0.8V_M5_CPU
BM5/BM5S	DC/DC	IC811	0.8V_M5_GPU

BM5 and BM5S Board Model

Board	Operation	IC Ref	Voltage supply
BM5S	DC/DC	IC4800	1.8V_BE_DDC
BM5S	DC/DC	IC4801	1.1V_BE
BM5S	DC/DC	IC4802	0.9V_BE_DDC_1
BM5S	DC/DC	IC4803	0.9V_BE_DDC_2
BM5S	DC/DC	IC4809	0.8V_BE
BM5S	DC/DC	IC4810	0.7V_BE

DDCONs and LDO check

Please refer page 25 - 26 for Ref number.

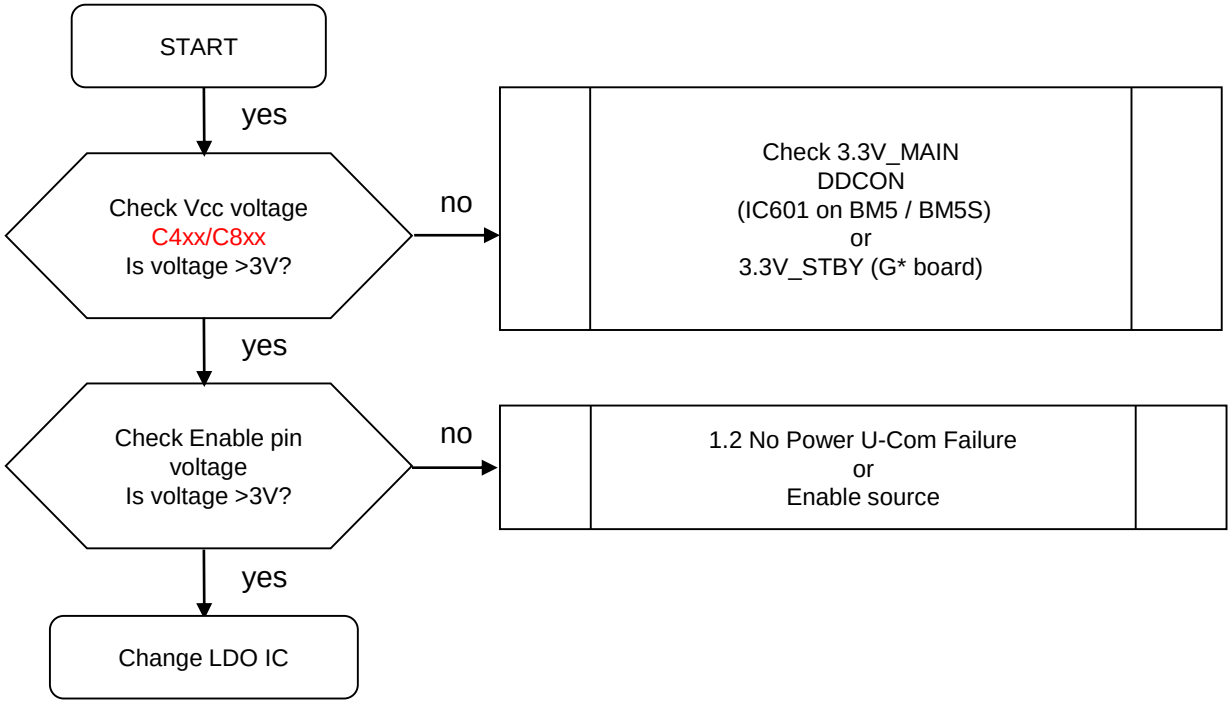


1.3 No Power DDCON/LDO

BM5 and BM5S Board Model

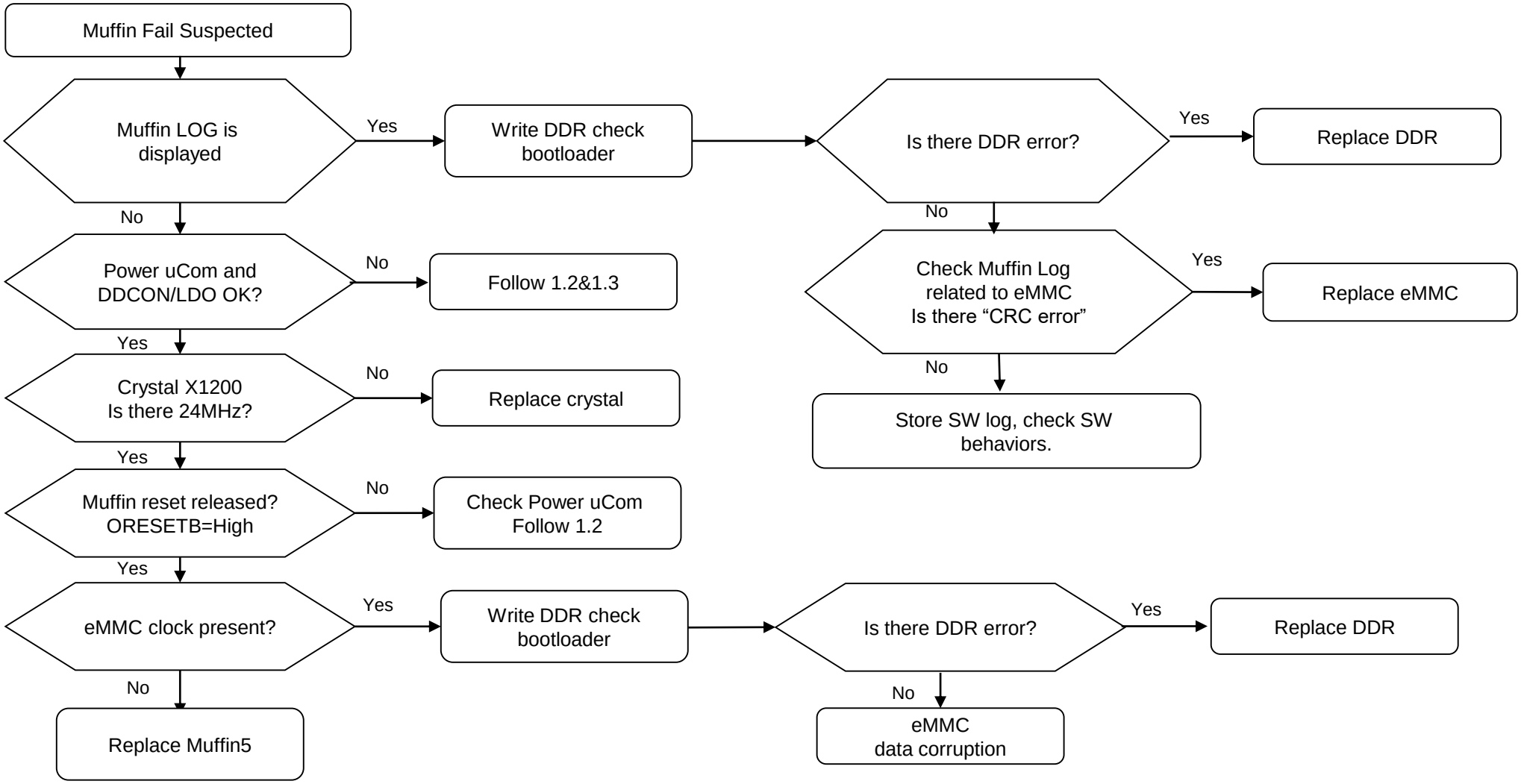
LDOs check

Please refer page 25 - 26 for Ref number.

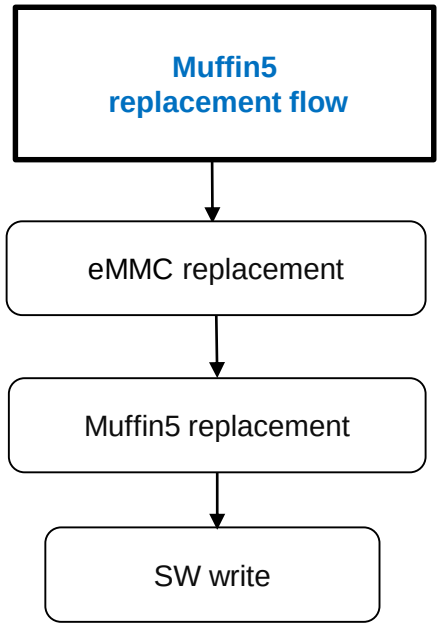


Board	Operation	IC Ref	Voltage supply
BM5/BM5S	LDO	IC403	3.3V_MAIN_H
BM5/BM5S	LDO	IC806	1.8V_M5_ET_STBY
BM5/BM5S	LDO	IC809	3.3V_M5_STBY

1.4 No Power – Muffin5 Failure



1.5 No Power – Muffin5 Replacement



eMMC need to be replaced when changing Muffin5.

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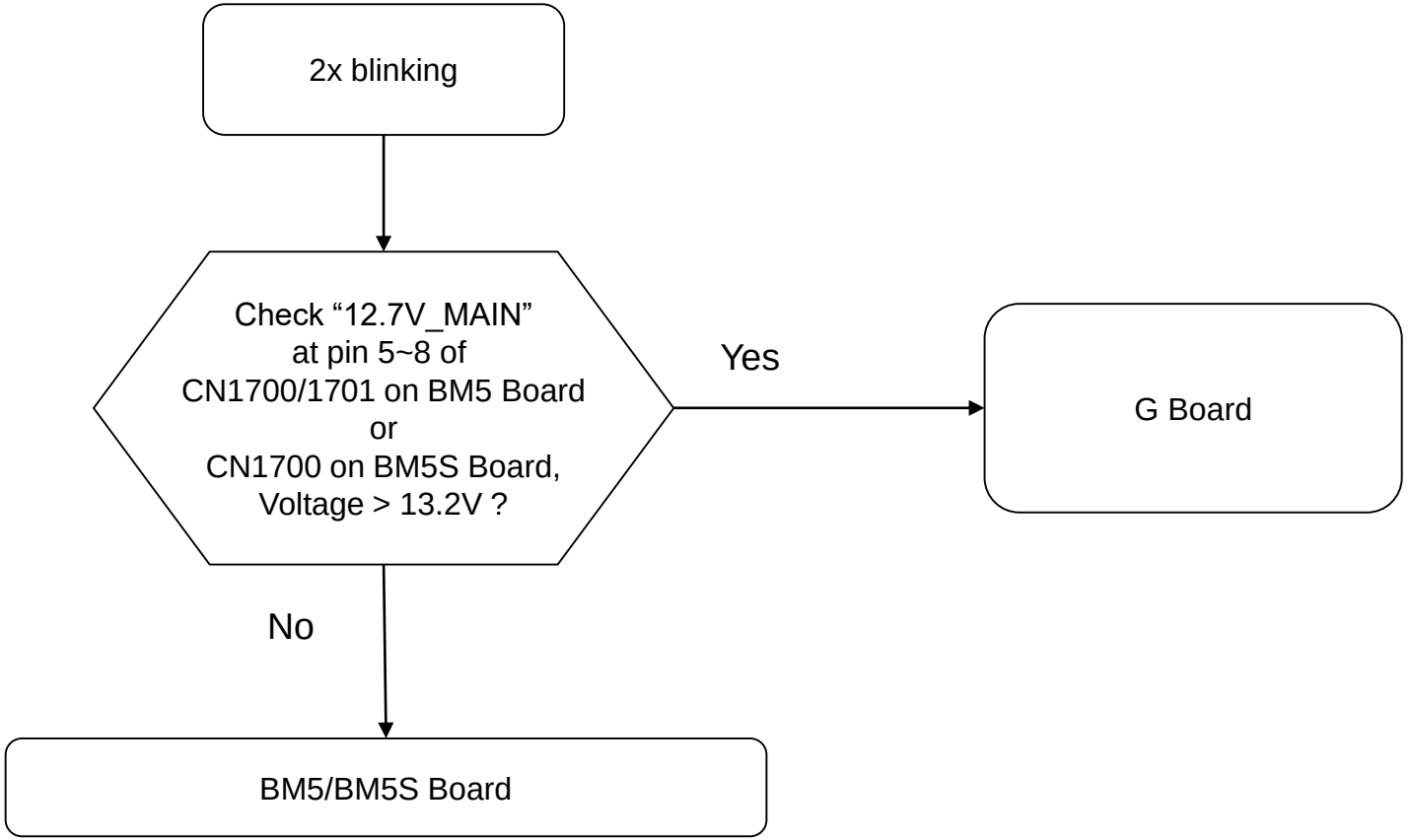
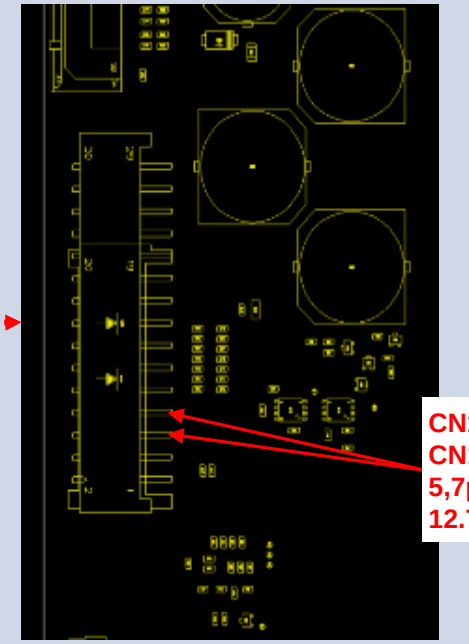
2.0 : 2x LED Blinking (Main power Error)

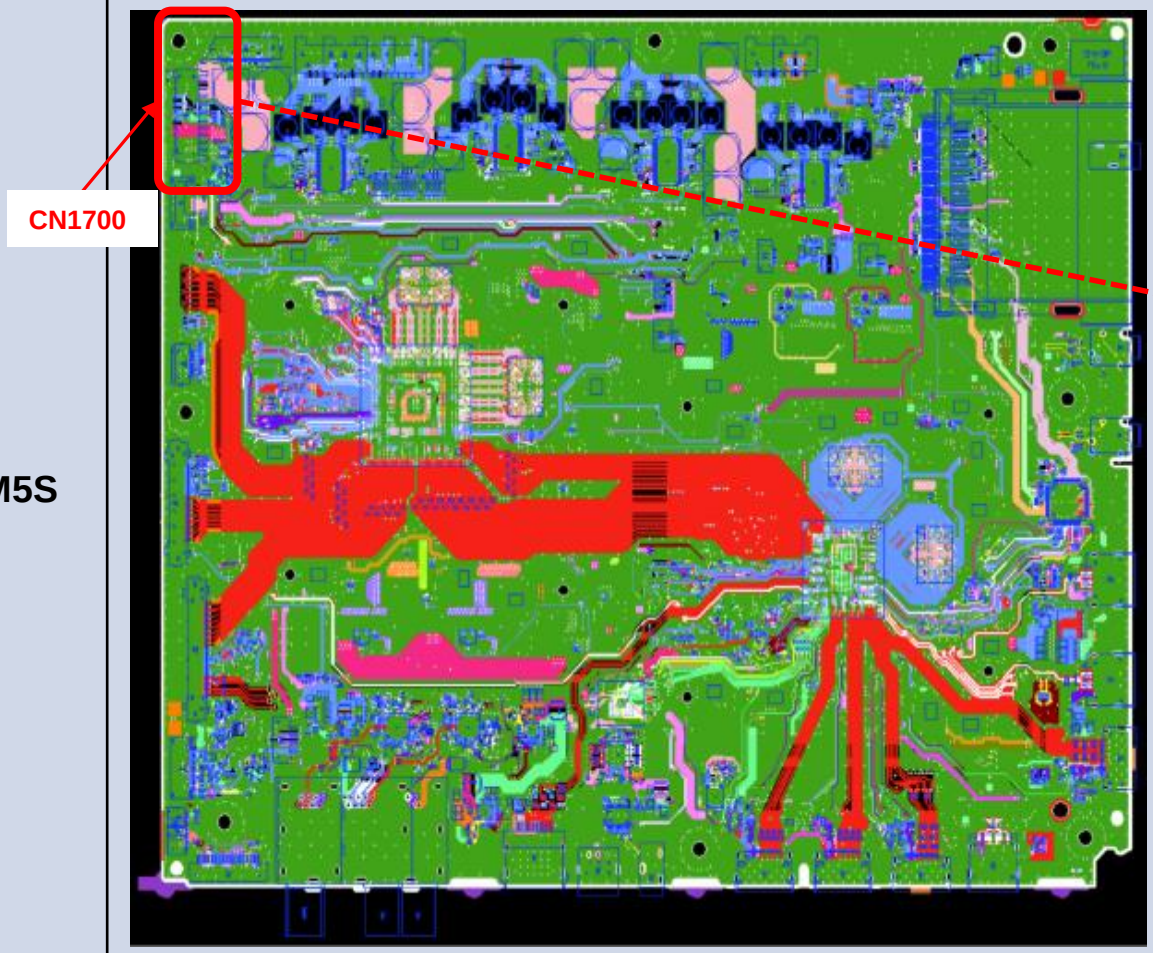
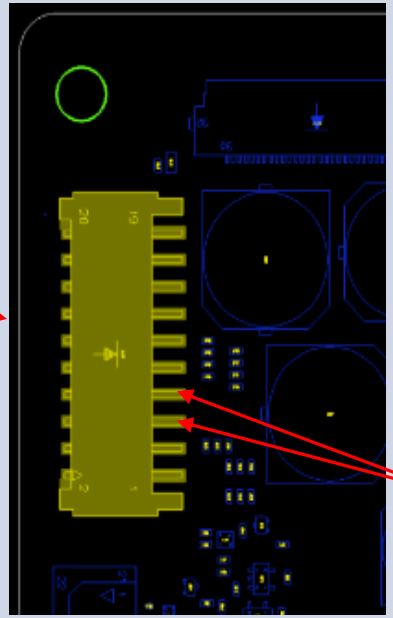
BM5/BM5S Board


2x blinking
Check “12.7V_MAIN” at pin 5~8 of CN1700/1701 on BM5 Board or CN1700 on BM5S Board, Voltage > 13.2V ?
Yes
G Board
No
BM5/BM5S Board

Check point for BM5

Name	Board PWB (A side)	Detail
BM5		

Check point for BM5S

Name	Board PWB (A side)	Detail
BM5S		

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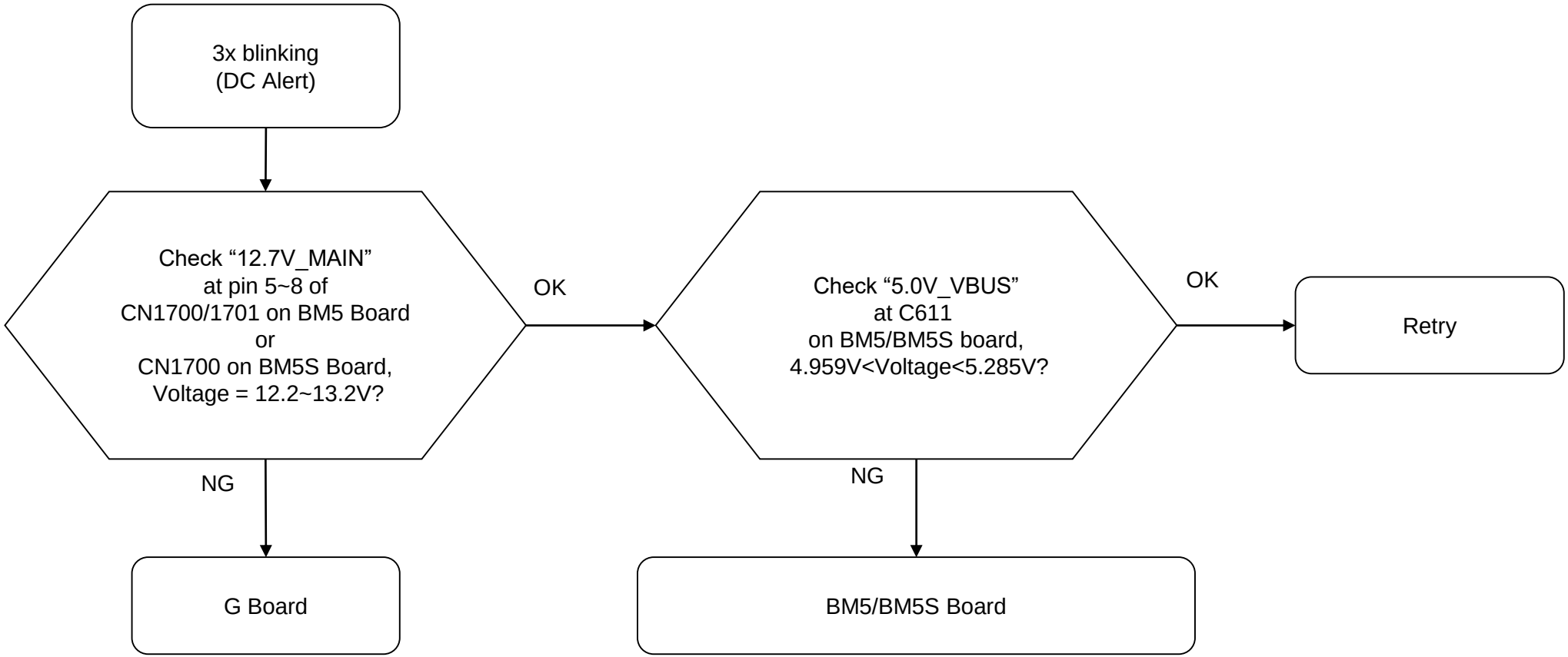
2.1 : Contents of 3x LED Blinking

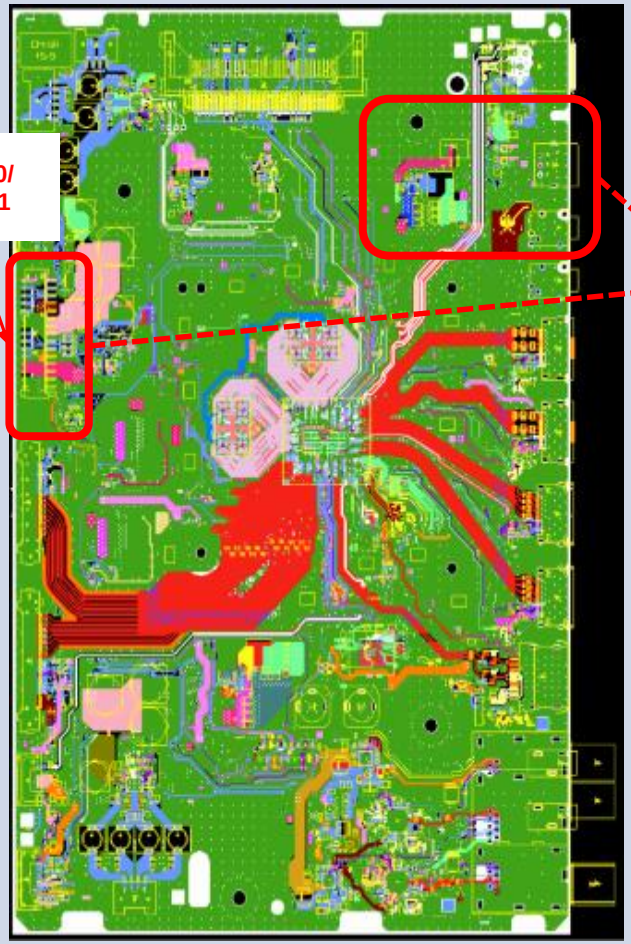
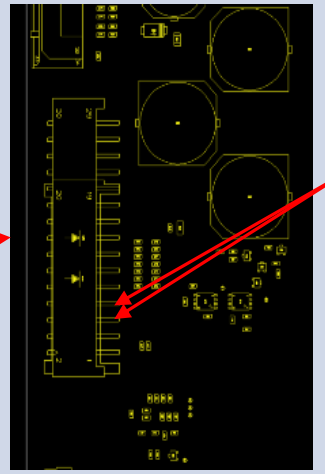
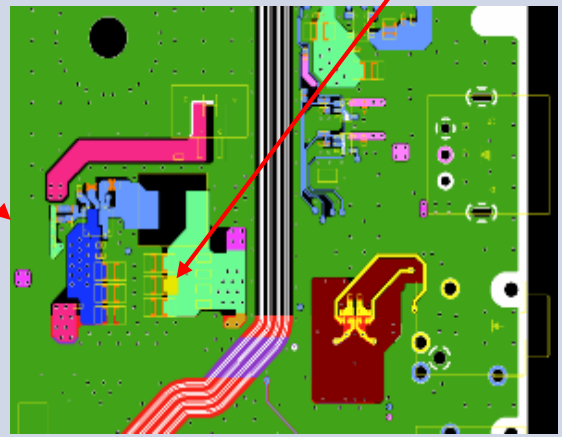
	Error Item	Number of STBY LED Blinking	Description
Valhalla	DC_ALERT	3	Main 5V power failure
	AUD_ERR	3	Audio amp. protection

2.1 : 3x LED Blinking (DC Alert)

BM5/BM5S Board



Check point for BM5

Name	Board PWB (A side)	Detail
BM5		 

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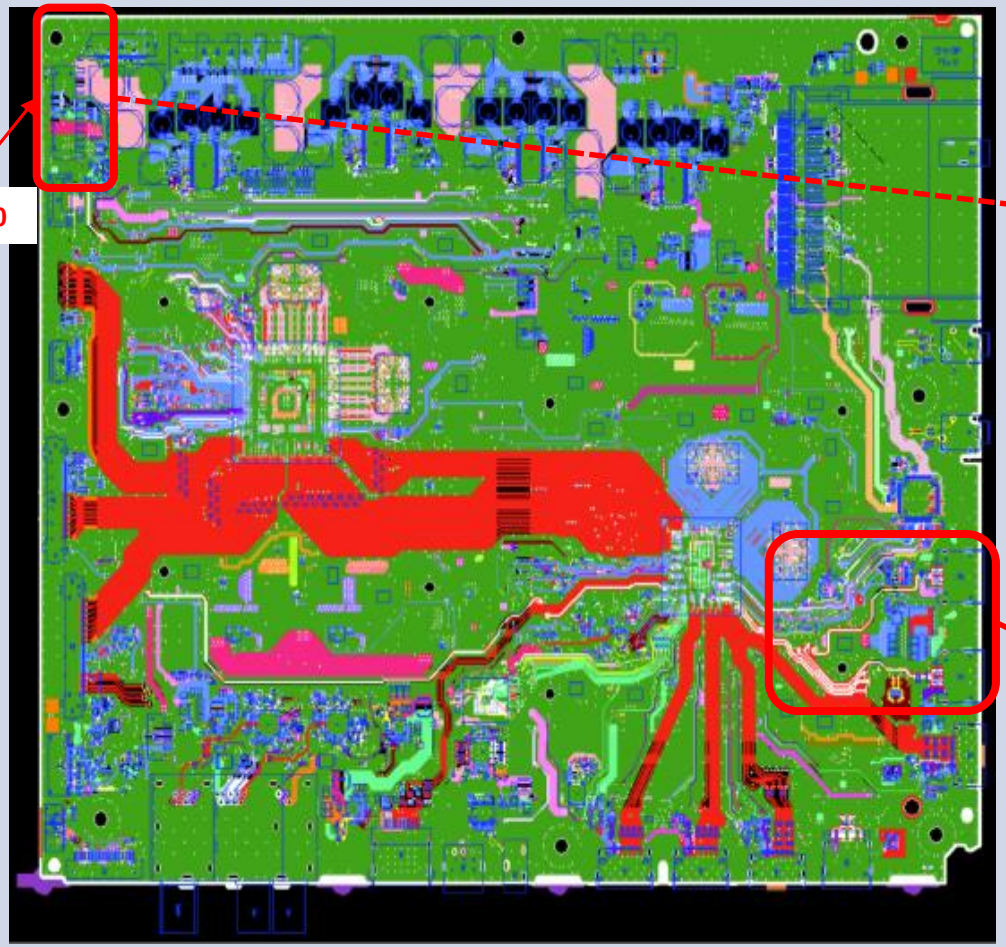
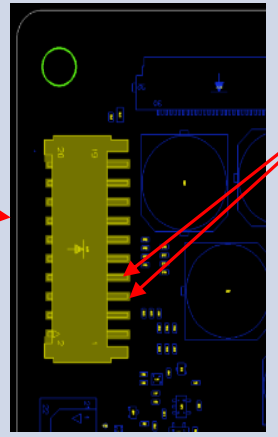
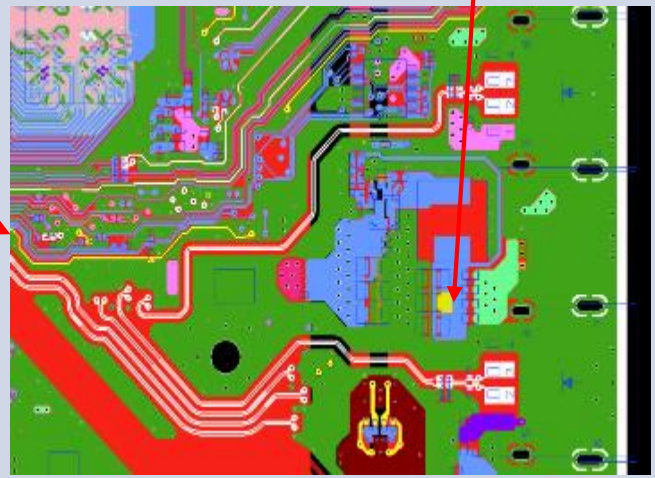
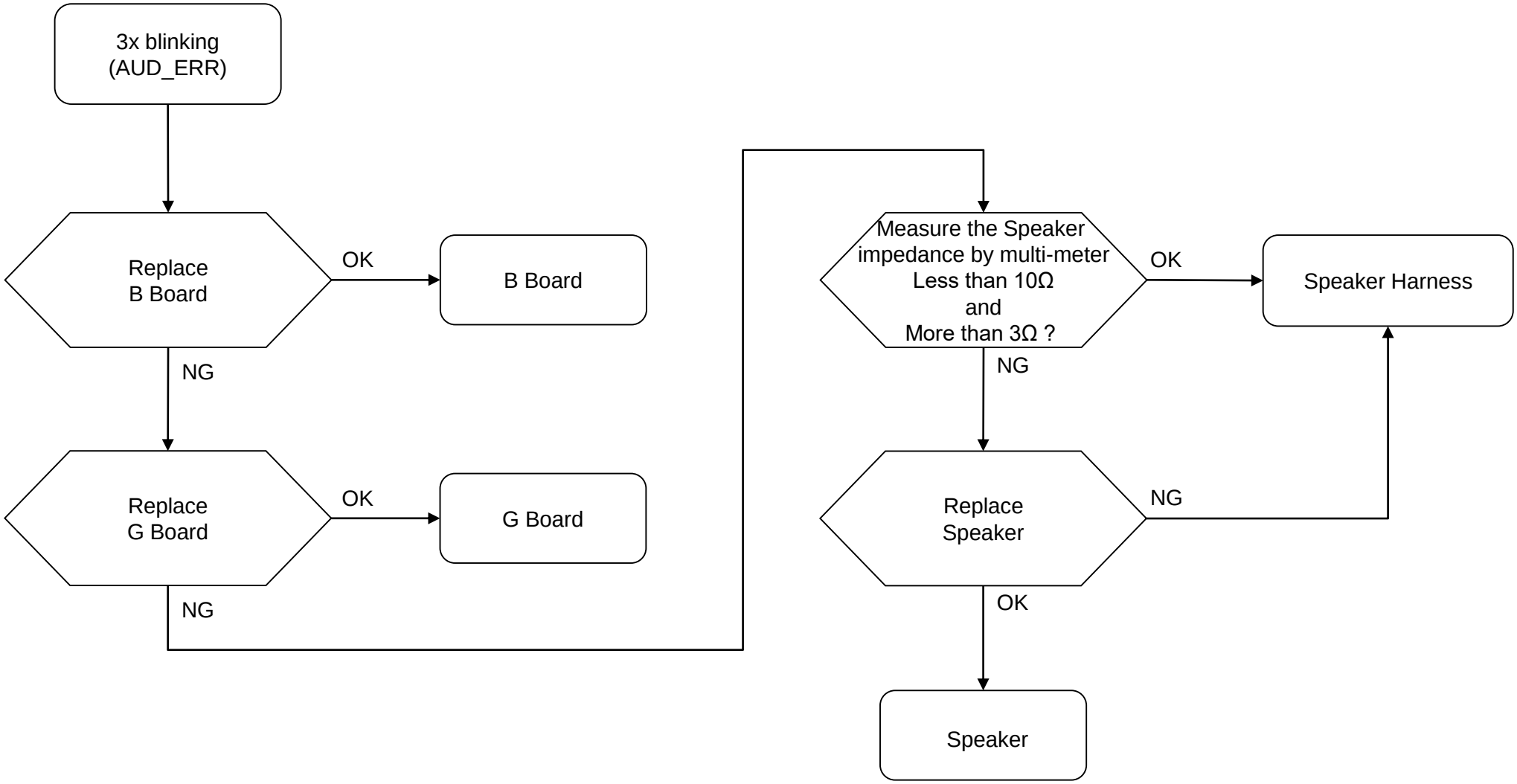
Check point for BM5S

Name	Board PWB (A side)	Detail
BM5S		 

2.2 : Contents of 3x LED Blinking

	Error Item	Number of STBY LED Blinking	Description
Valhalla	DC_ALERT	3	Main 5V power failure
	AUD_ERR	3	Audio amp. protection

2.2 : 3x LED Blinking (AUD_ERR)

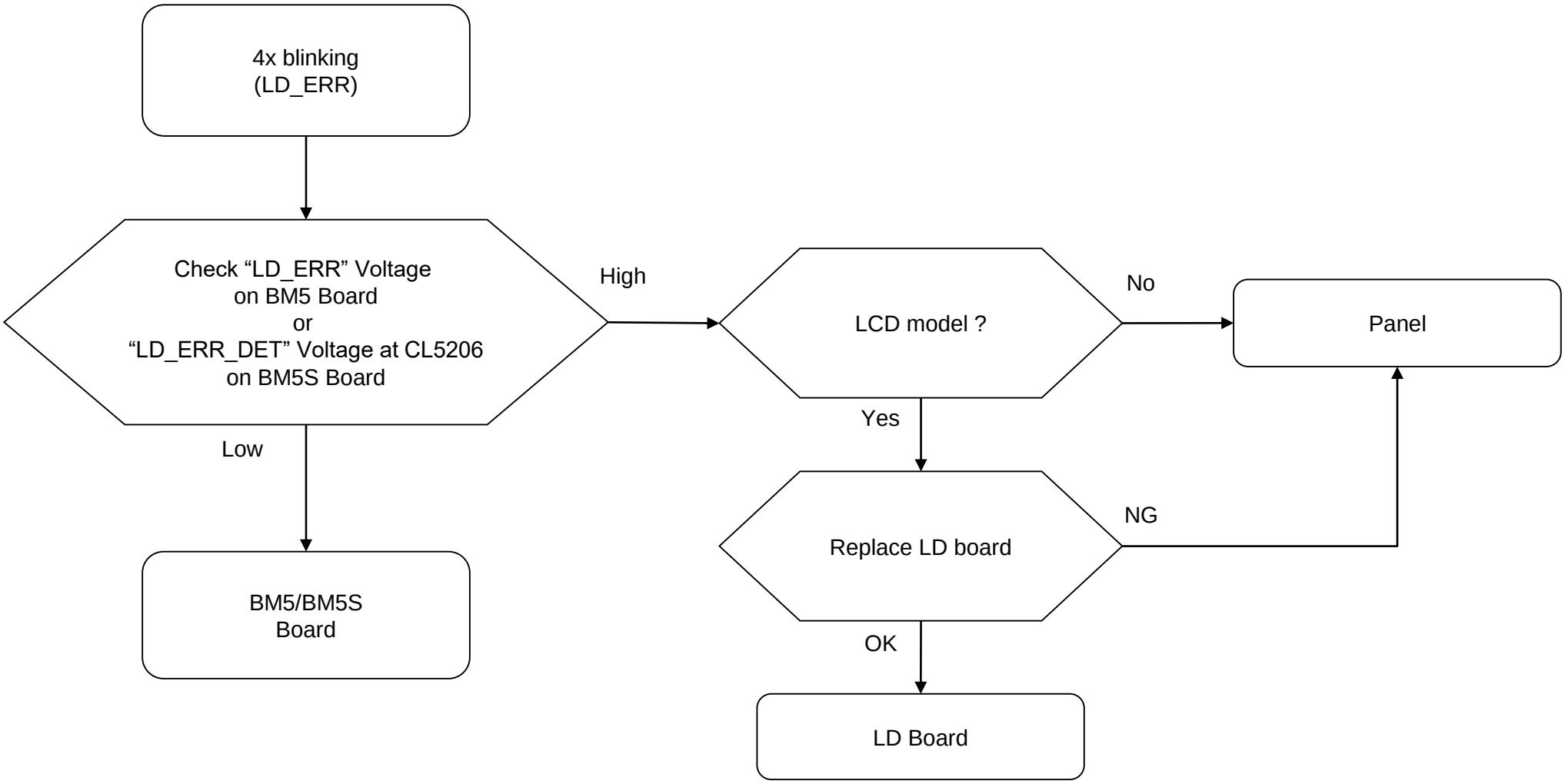


2.3 : Contents of 4x LED Blinking

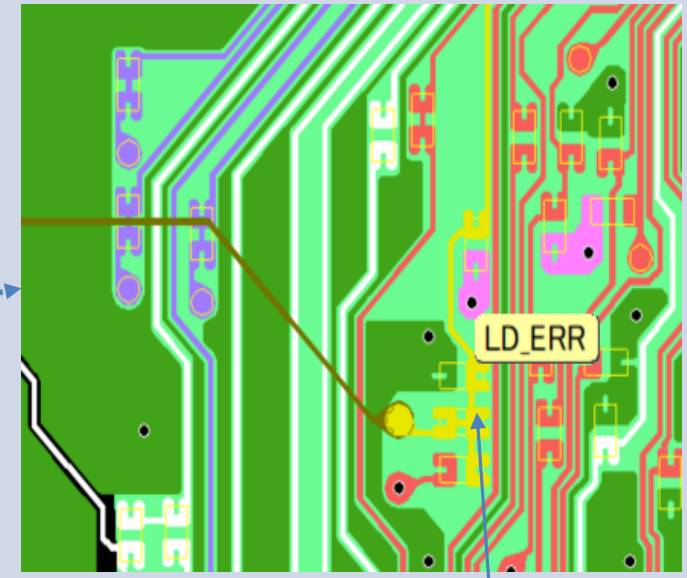
	Error Item	Number of STBY LED Blinking	Description	
Valhalla	LD_ERR	4	LCD	LED driver failure/LED voltage protection
			OLED	TCON internal or I2C communication failure
	BCM_ERR	4	LCD	LD IC initialize or I2C communication failure
			OLED	Panel power failure

2.3 : 4x LED Blinking (LD-ERR)

BM5/BM5S Board



Check point for BM5

Name	Board PWB (A side)	Detail (B side)
BM5		 LD_ERR is represented as yellow line

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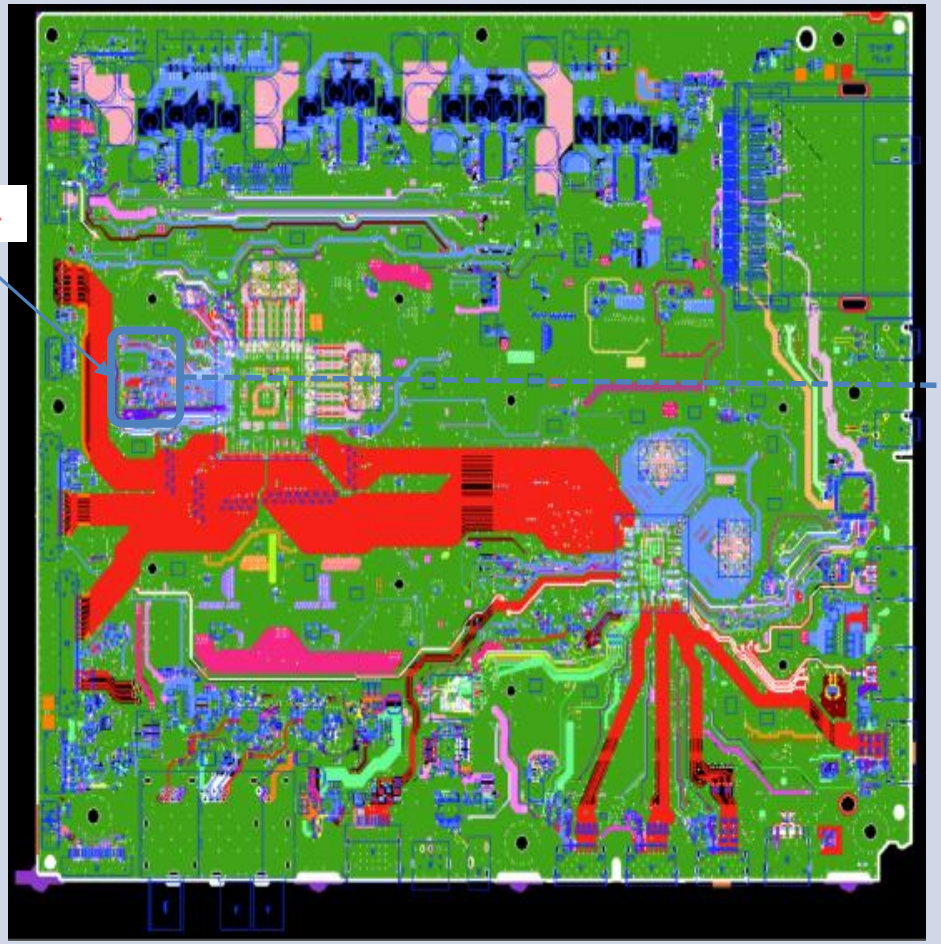
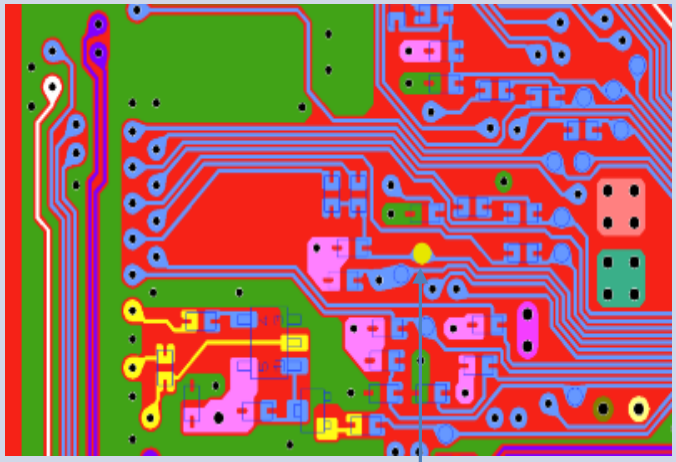
Check point for BM5S

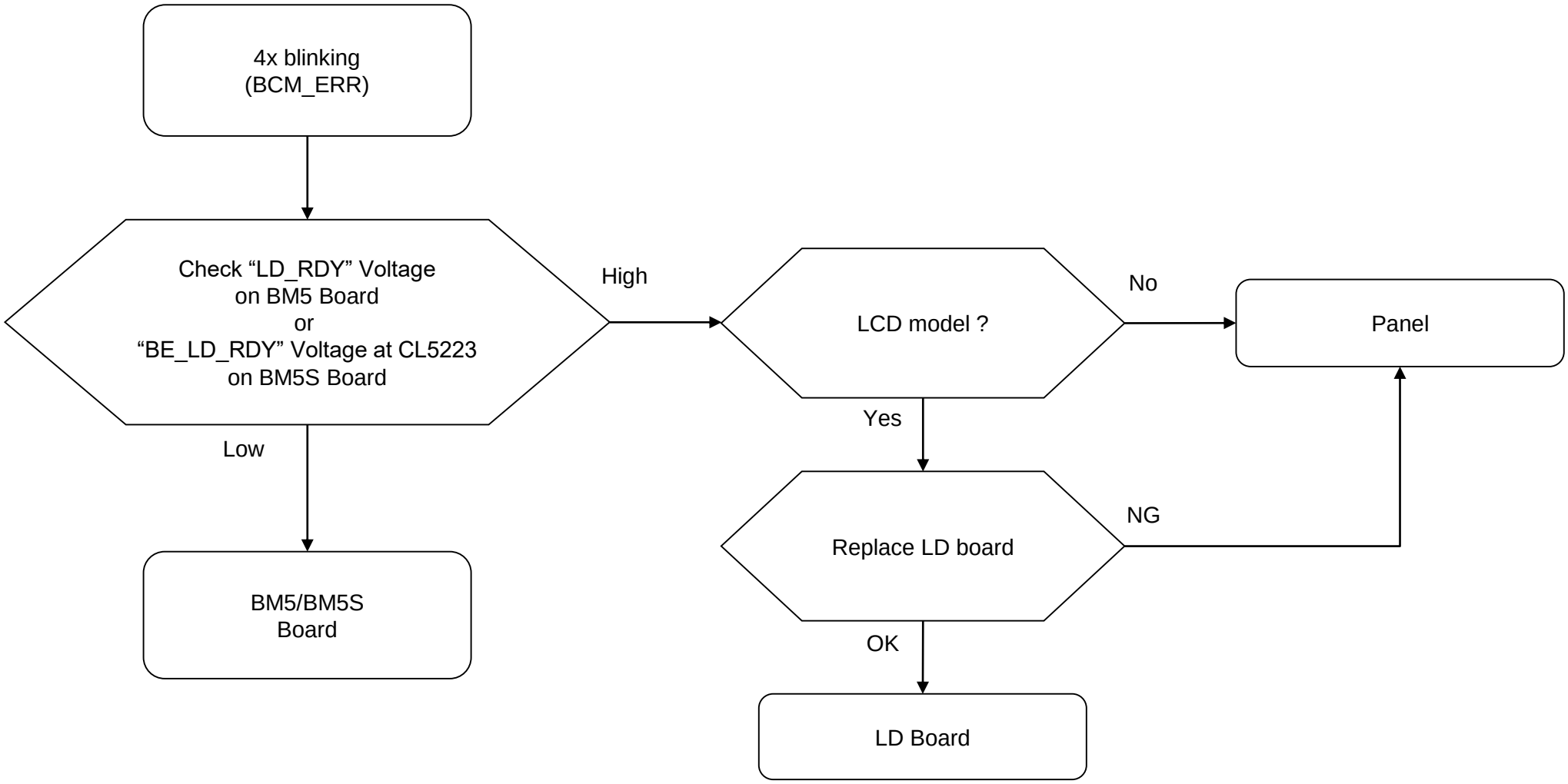
Name	Board PWB (A side)	Detail (B side)
BM5S		

2.4 : Contents of 4x LED Blinking

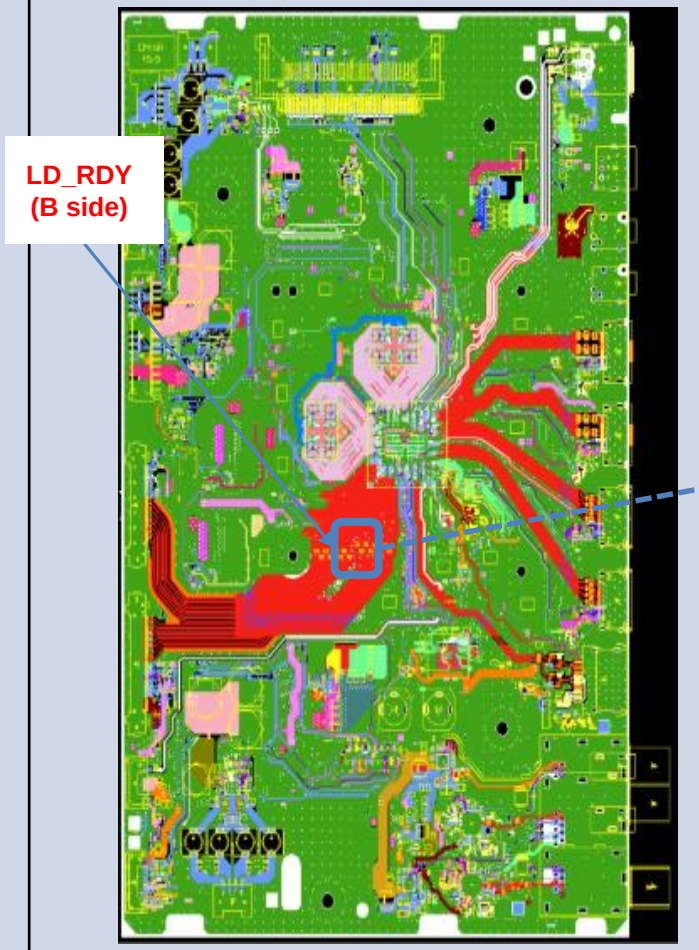
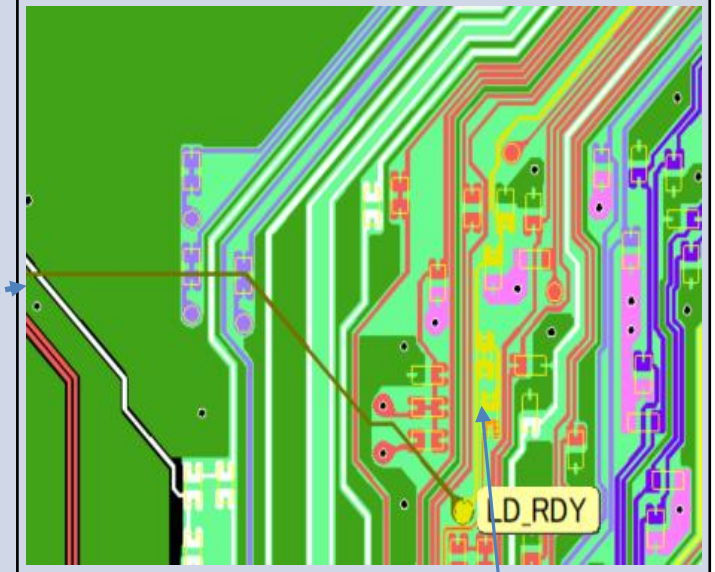
	Error Item	Number of STBY LED Blinking	Description	
Valhalla	LD_ERR	4	LCD	LED driver failure/LED voltage protection
			OLED	TCON internal or I2C communication failure
	BCM_ERR	4	LCD	LD IC initialize or I2C communication failure
			OLED	Panel power failure

2.4 : 4x LED Blinking (BCM_ERR)

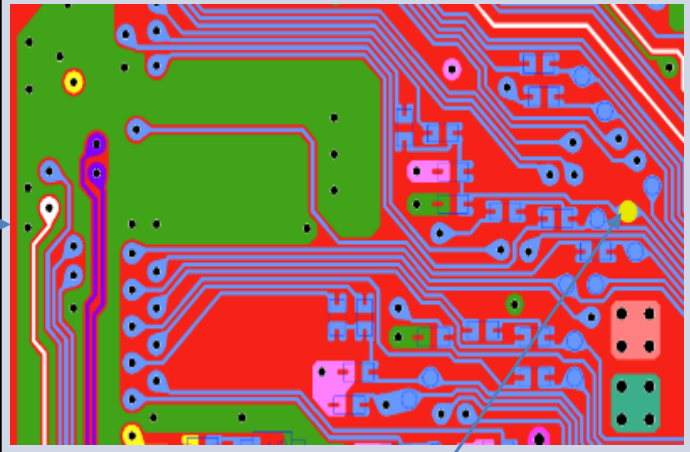
BM5/BM5S Board



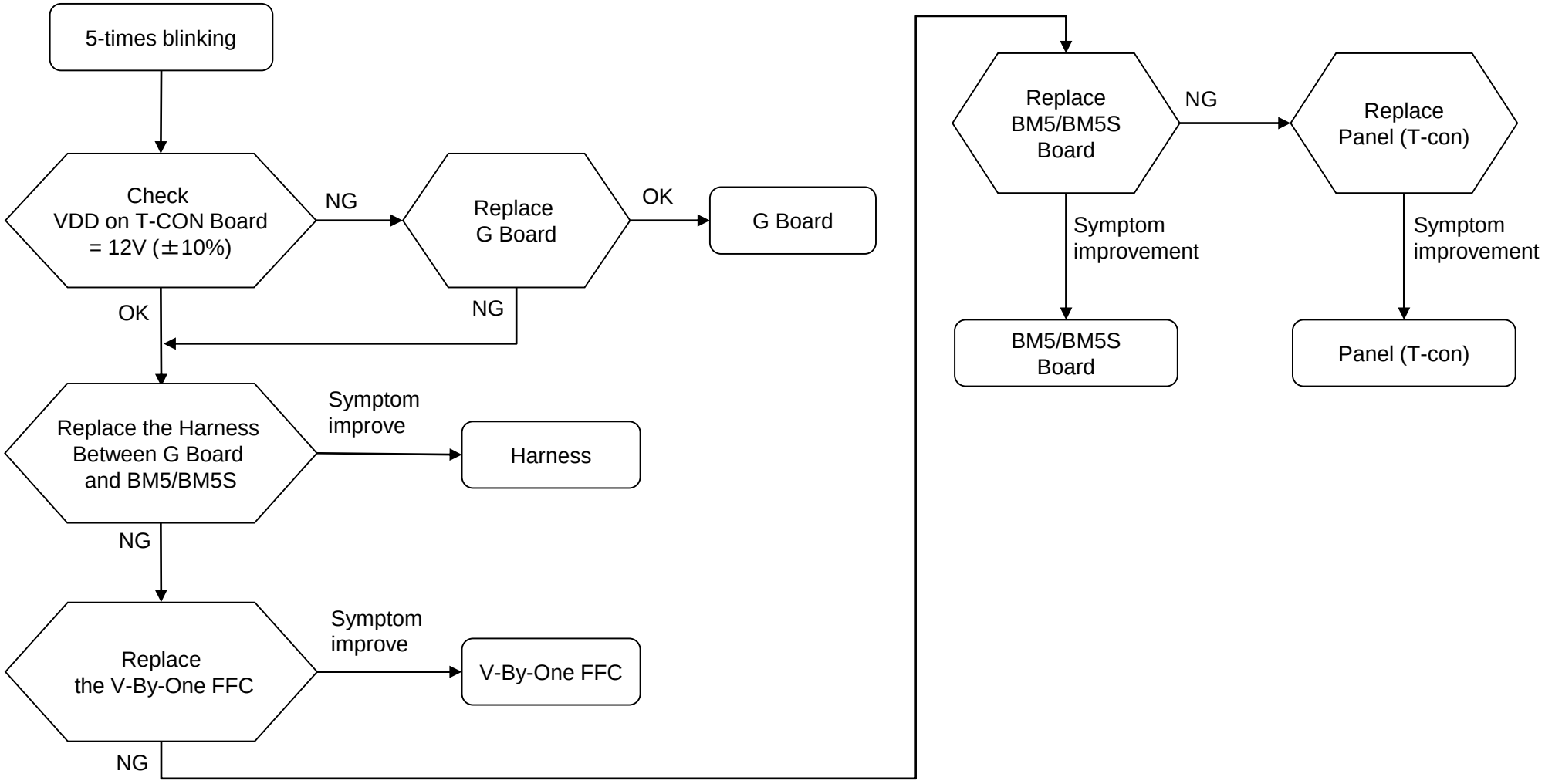
Check point for BM5

Name	Board PWB (A side)	Detail (B side)
BM5		

Check point for BM5S

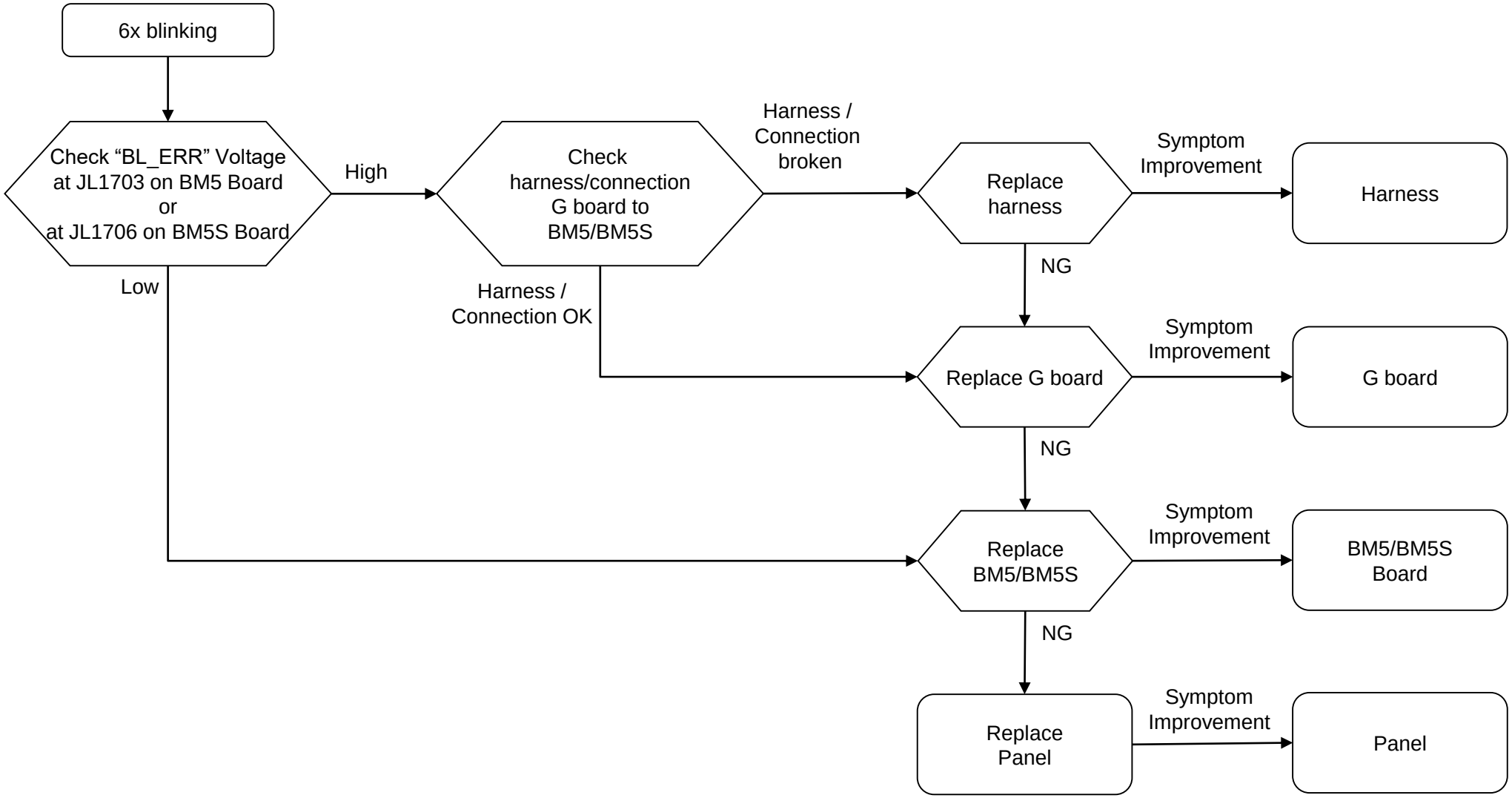
Name	Board PWB (A side)	Detail (B side)
BM5S		

2.5 : 5x LED Blinking (Panel ID Error)

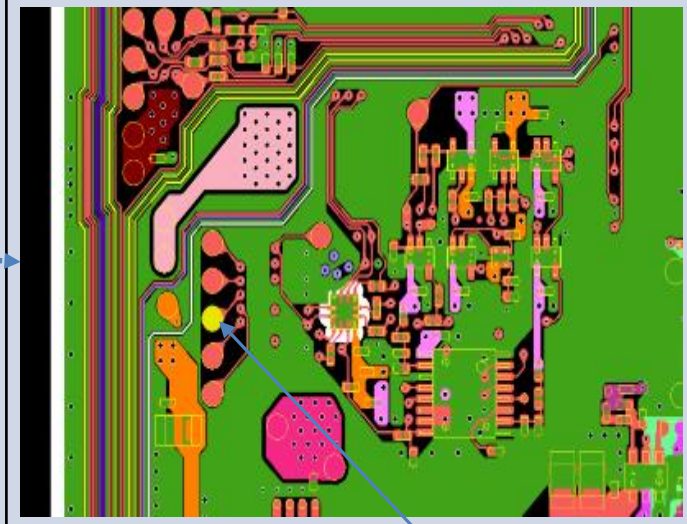


2.6 : 6x LED Blinking (BACKLIGHT_ERR)

BM5/BM5S Board



Check point for BM5

Name	Board PWB (A side)	Detail (B side)
BM5		

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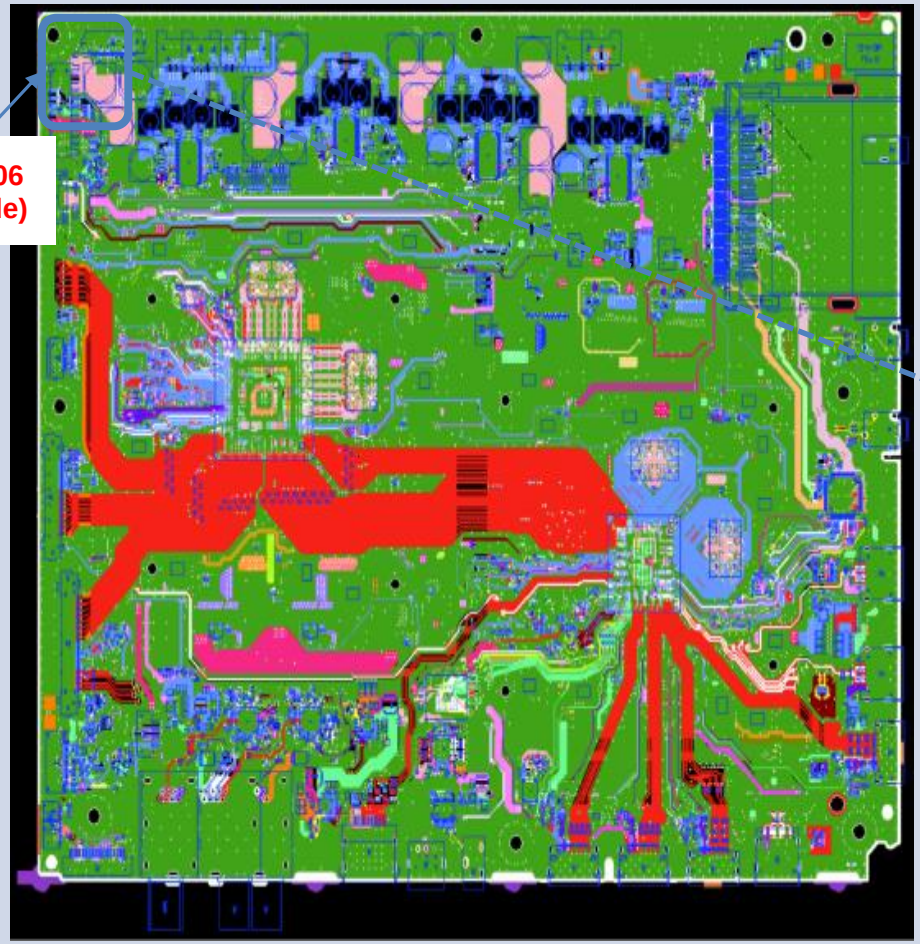
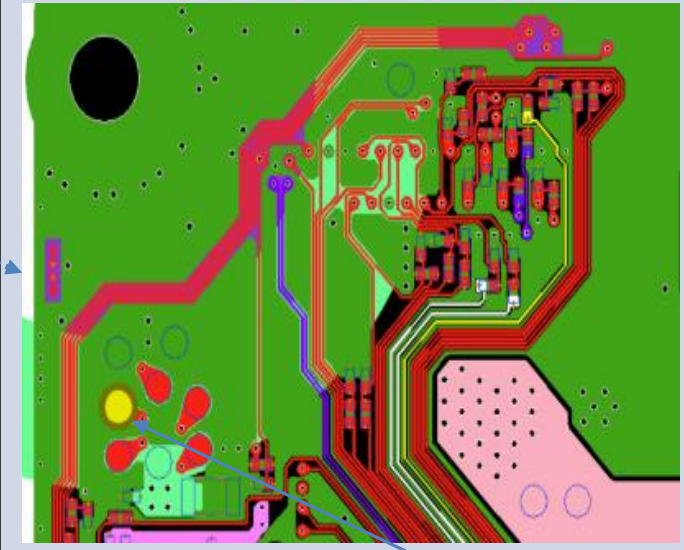
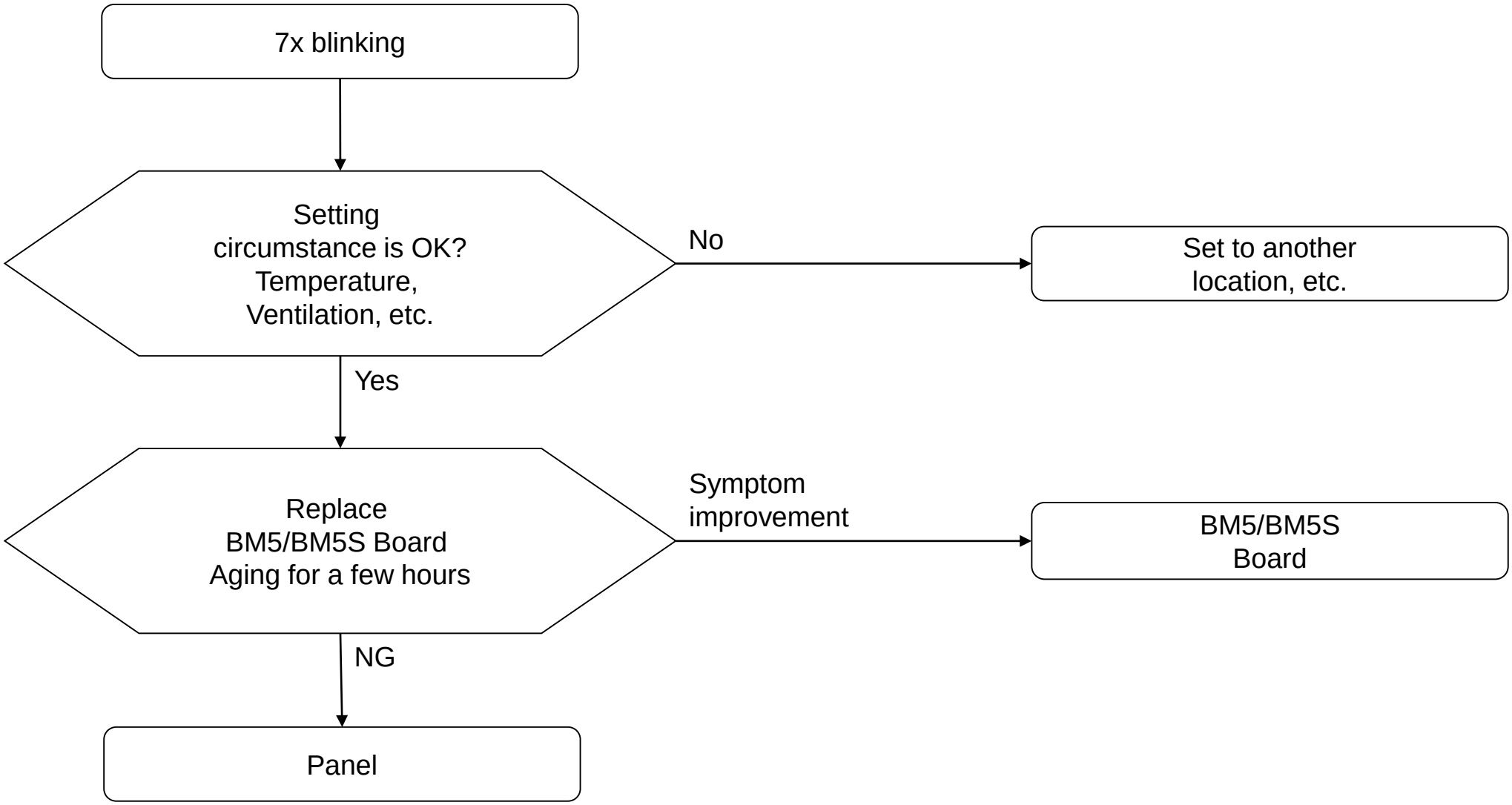
Check point for BM5S

Name	Board PWB (A side)	Detail (B side)
BM5S		

2.7 : 7x LED Blinking (TEMP_ERR)



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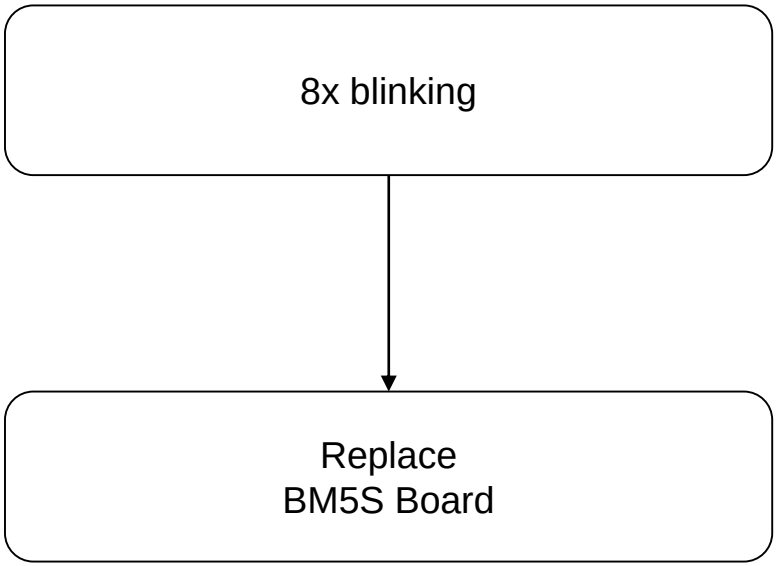
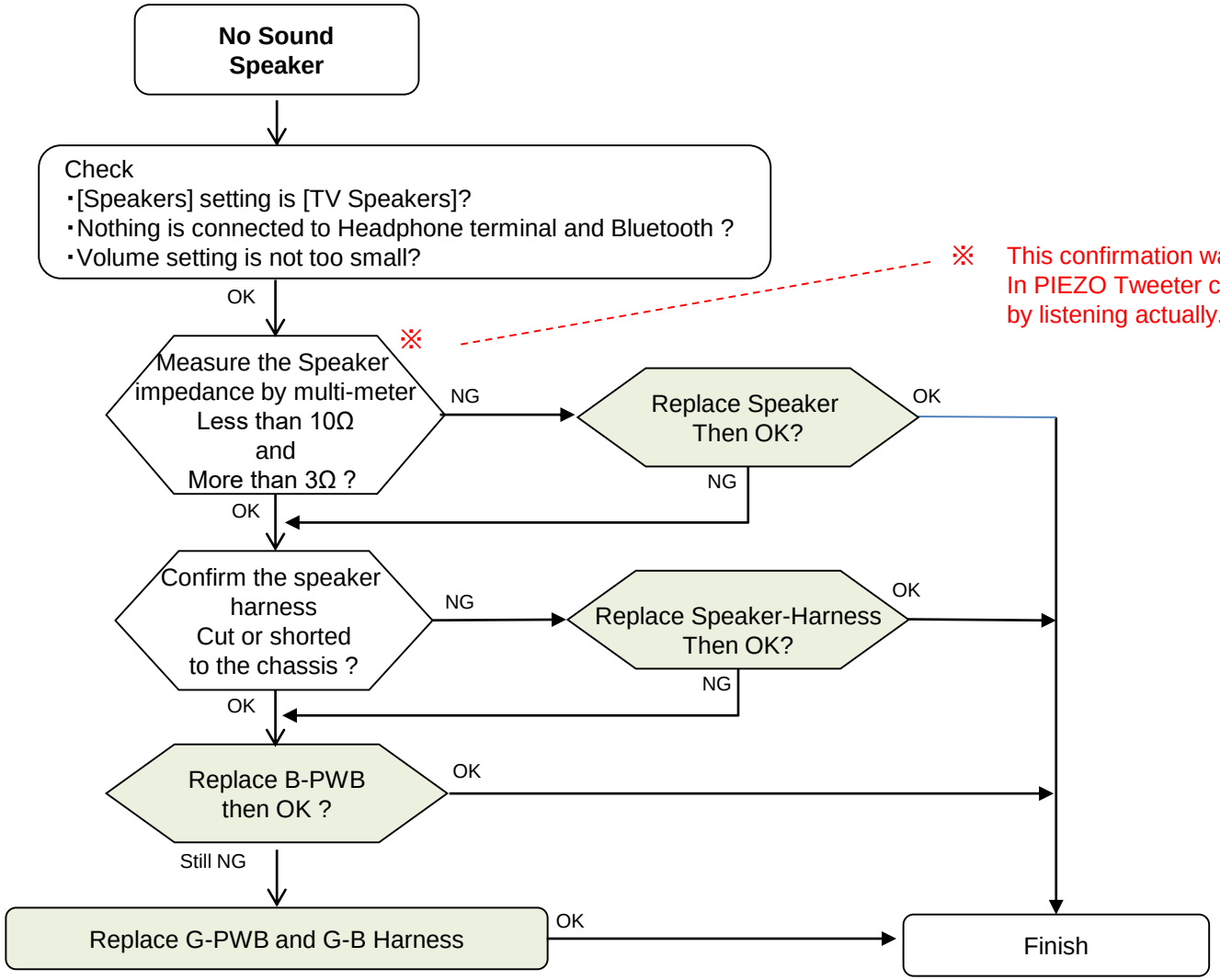
2.8 : 8x LED Blinking (4KBE_ERR)

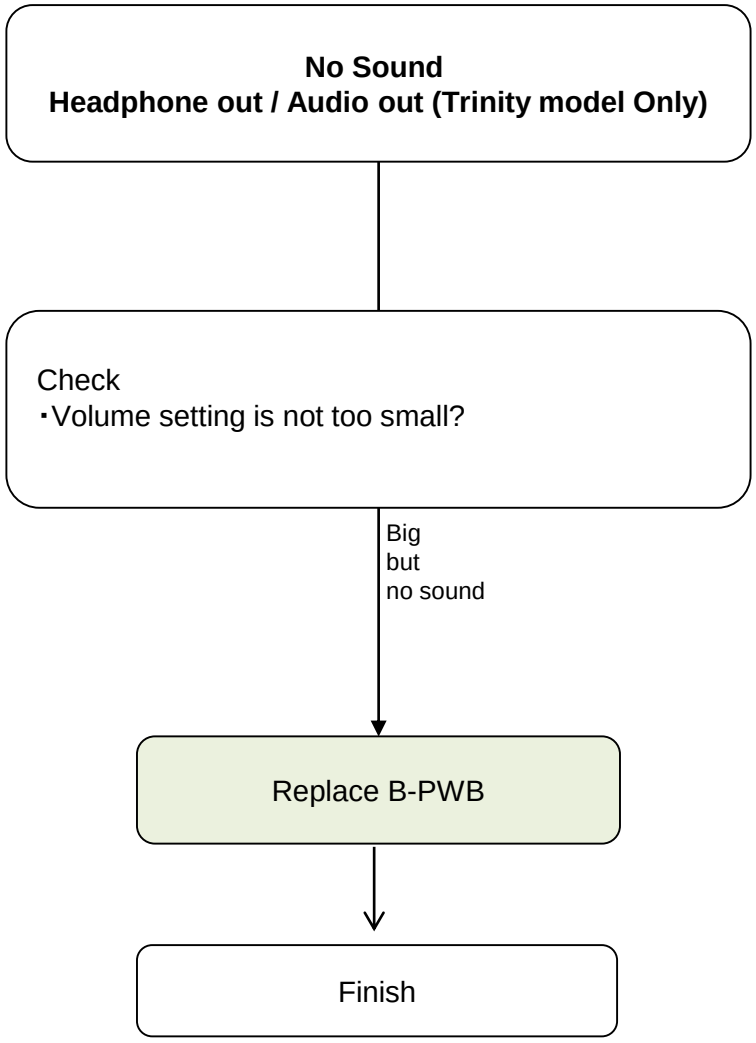


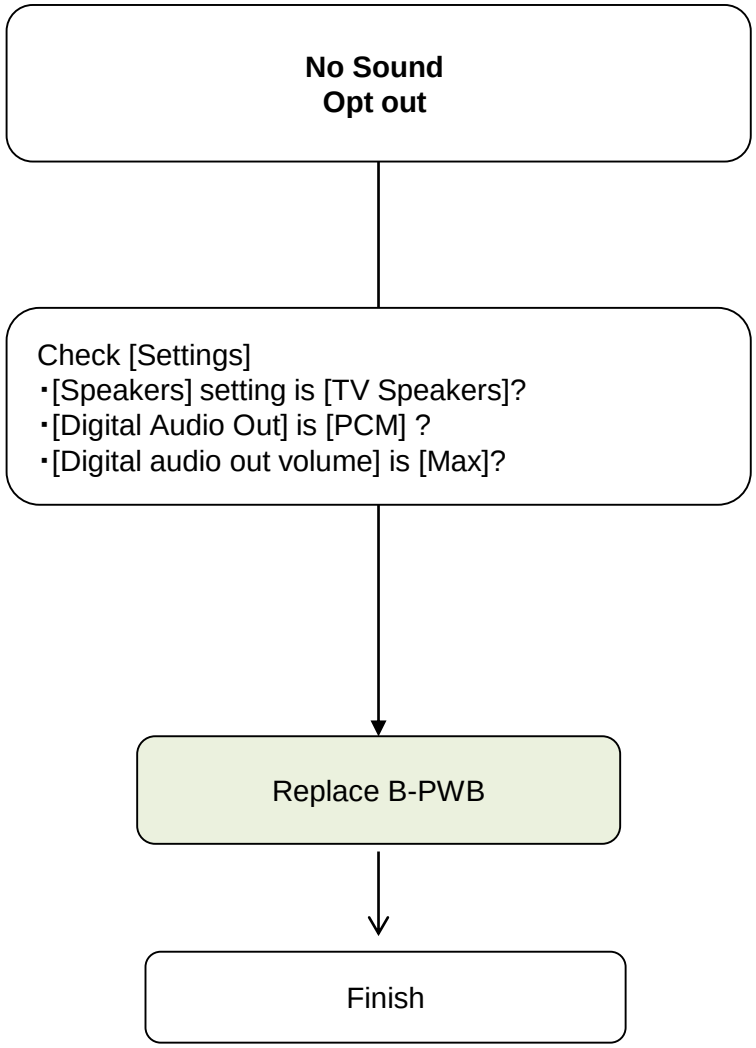
3.1 No Sound for Speaker



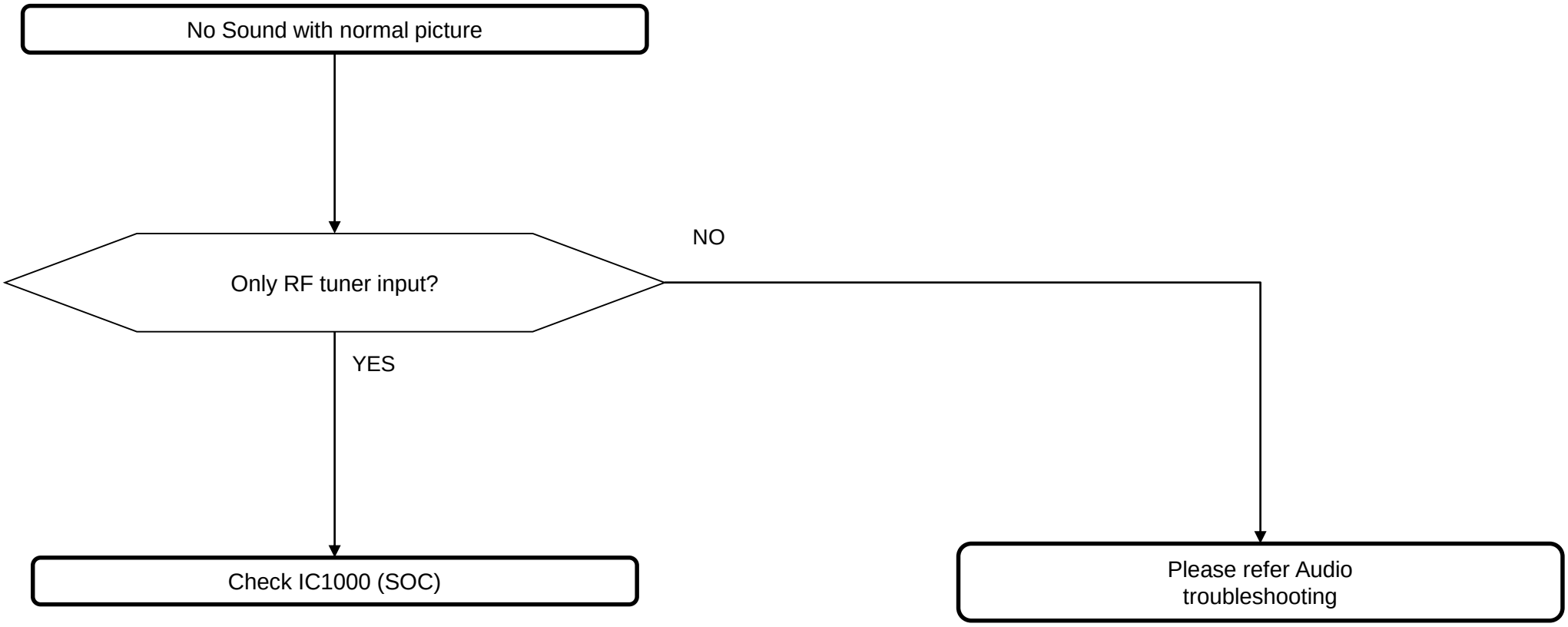
※ This confirmation way is only for traditional speaker & exciter.
In PIEZO Tweeter case, we can confirm OK or NG
by listening actually.

3.2 No Sound for Headphone out / Audio out / Optical out

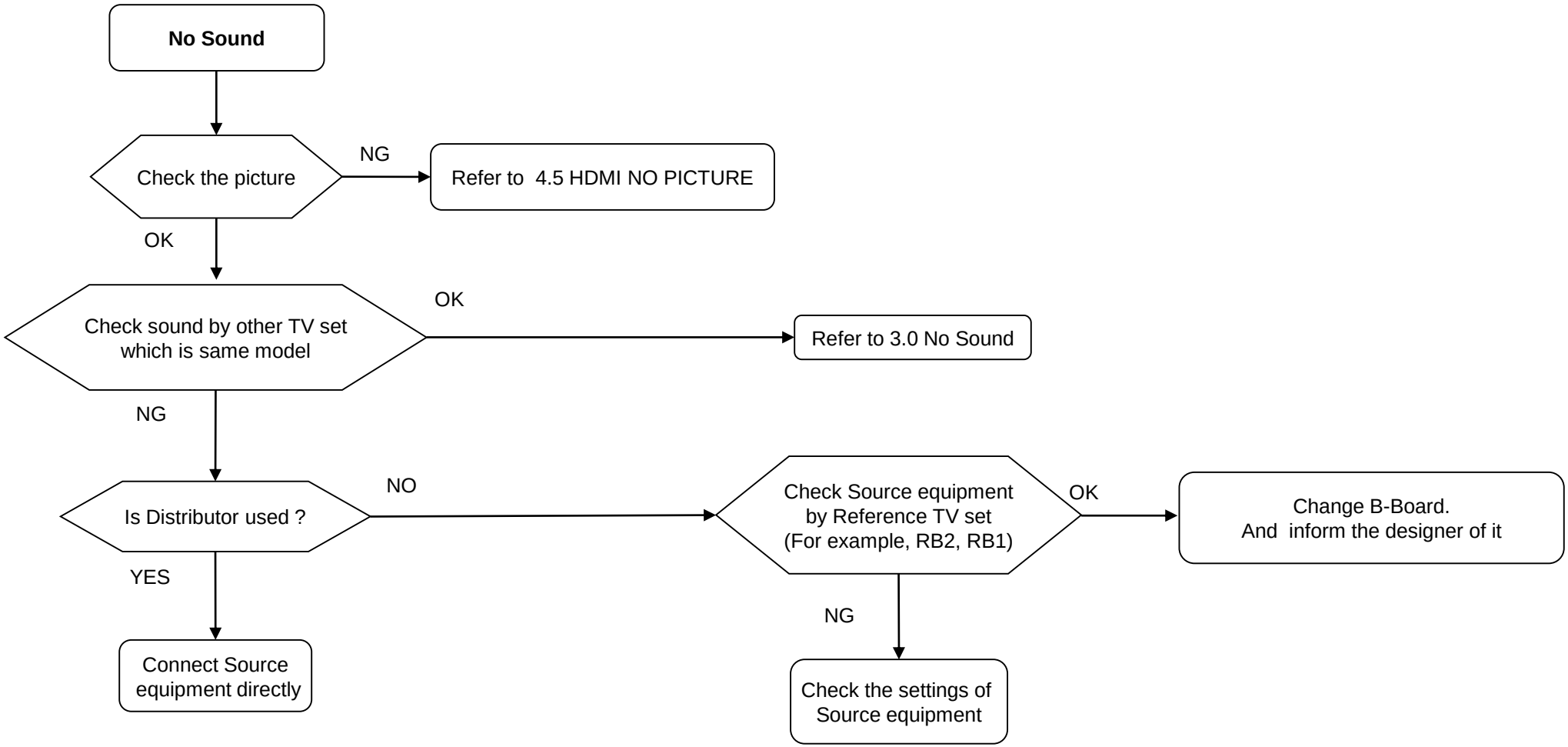




3.7 No Sound Tuner

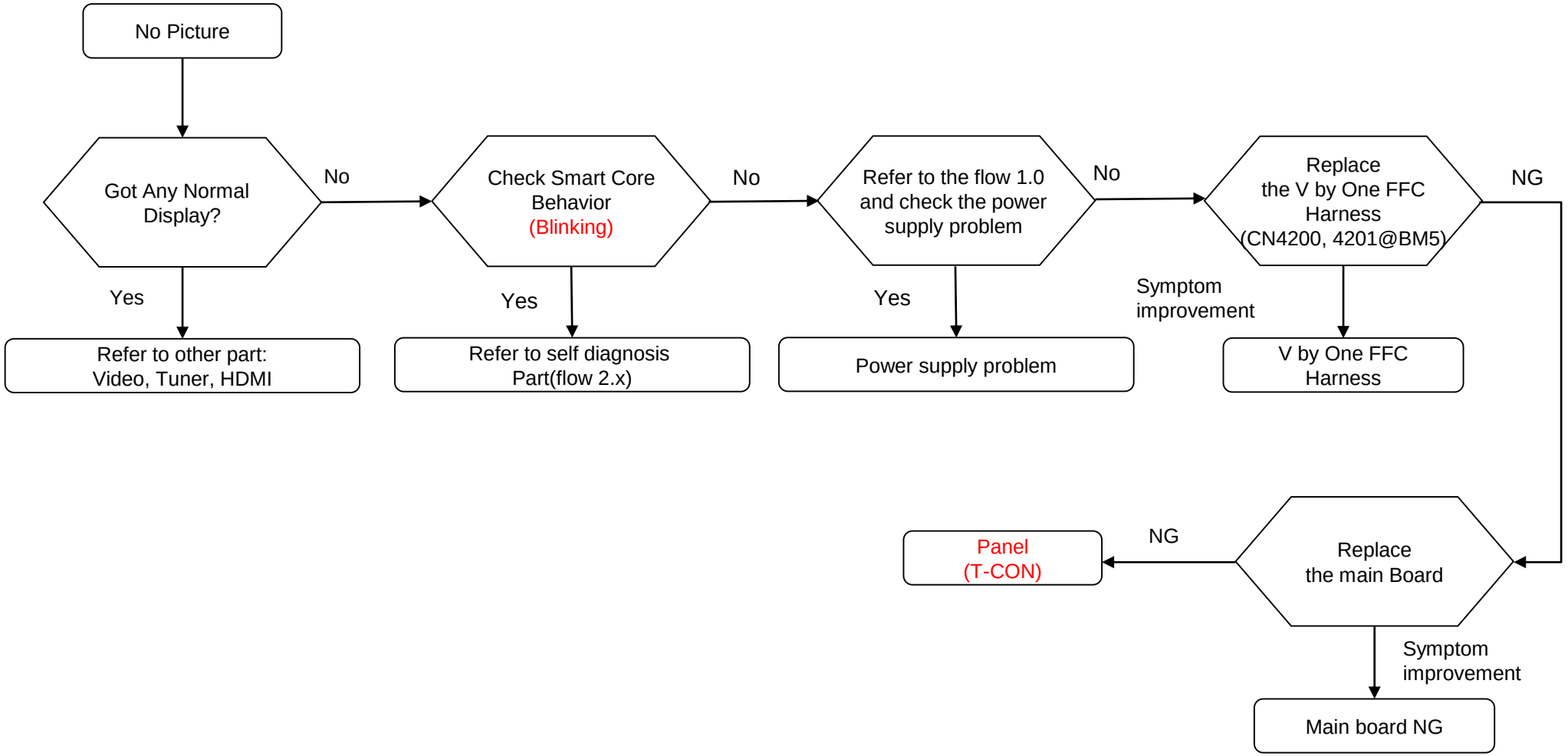


3.8 No Sound: HDMI 1/2/3/4



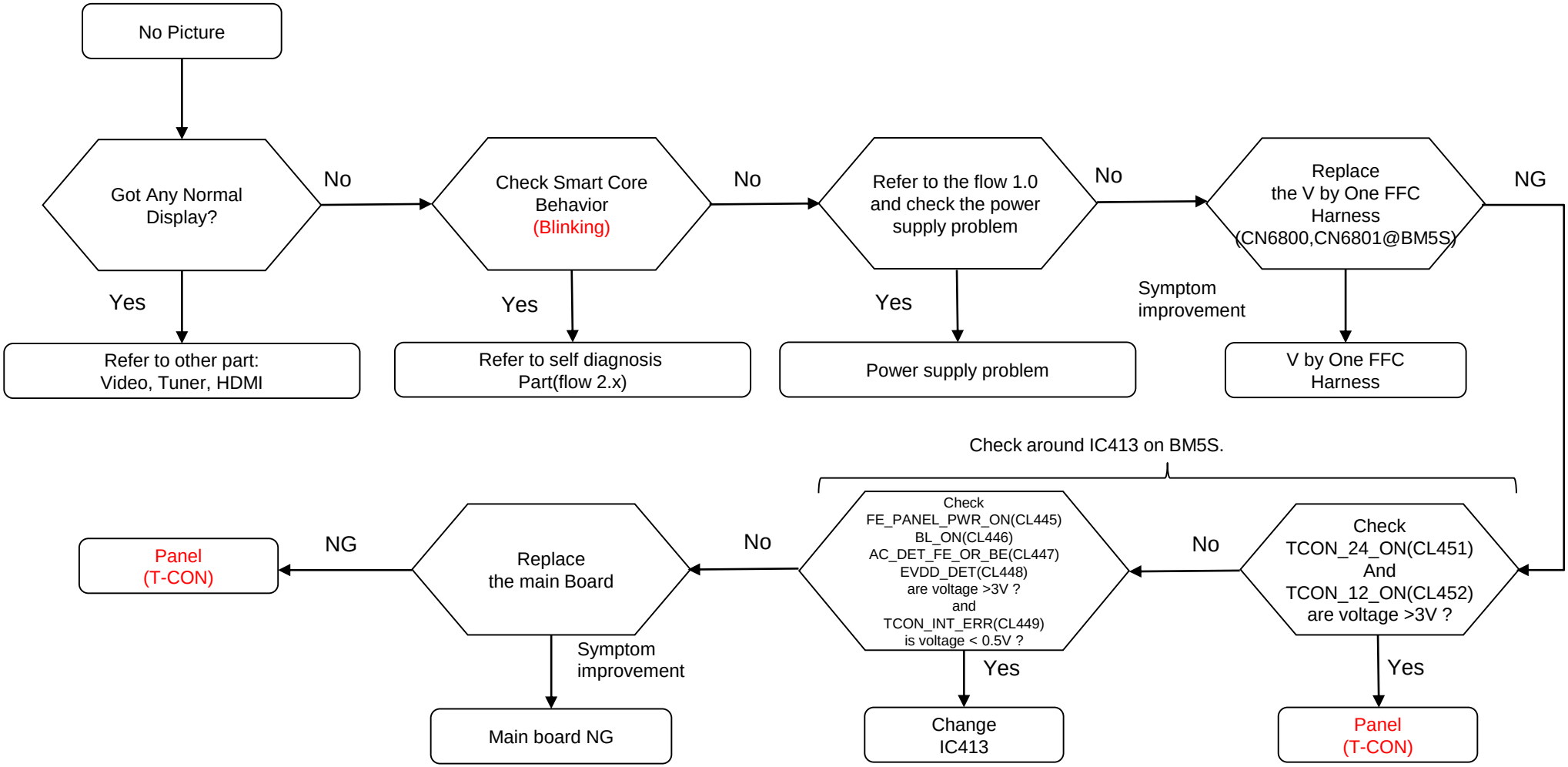
4.0 No Picture

BM5 Board LCD Model

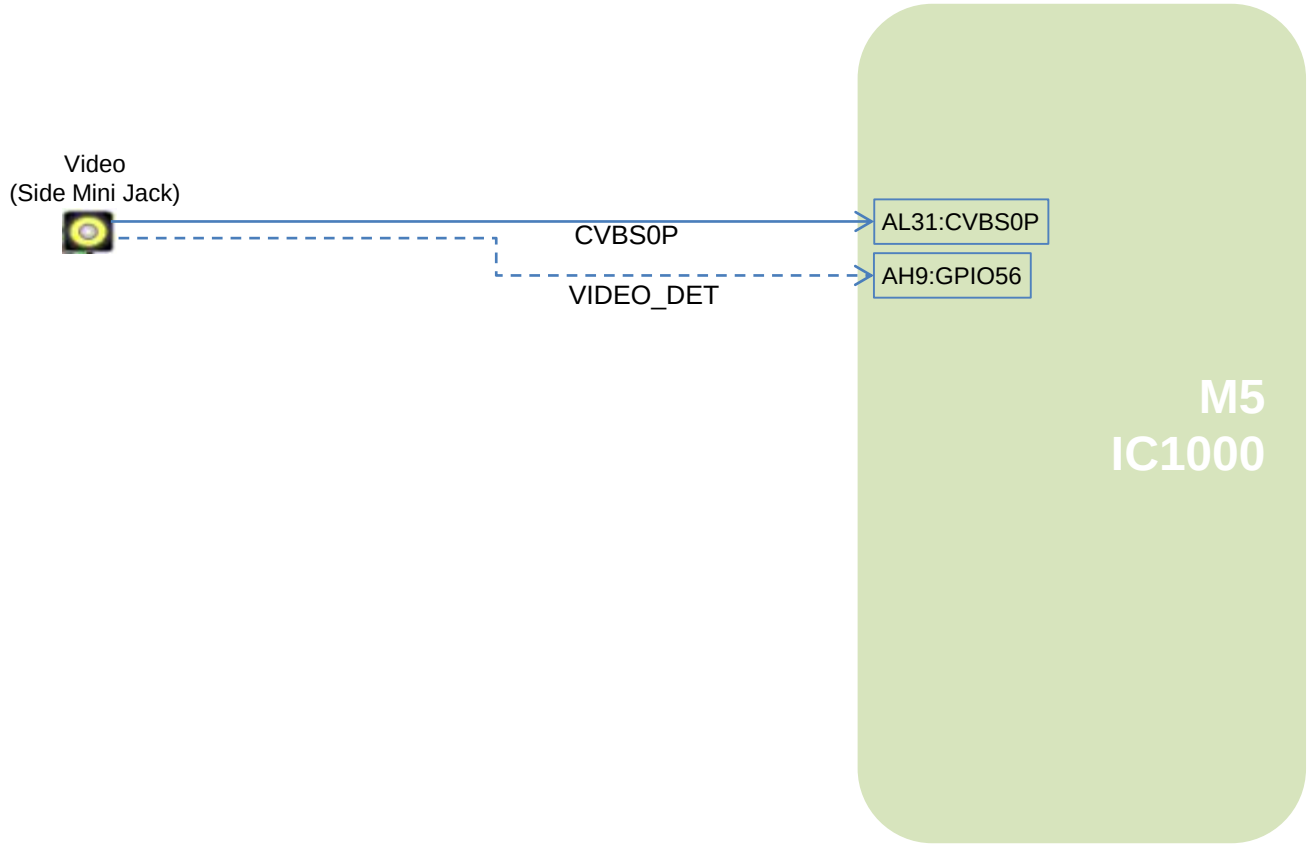


4.0 No Picture

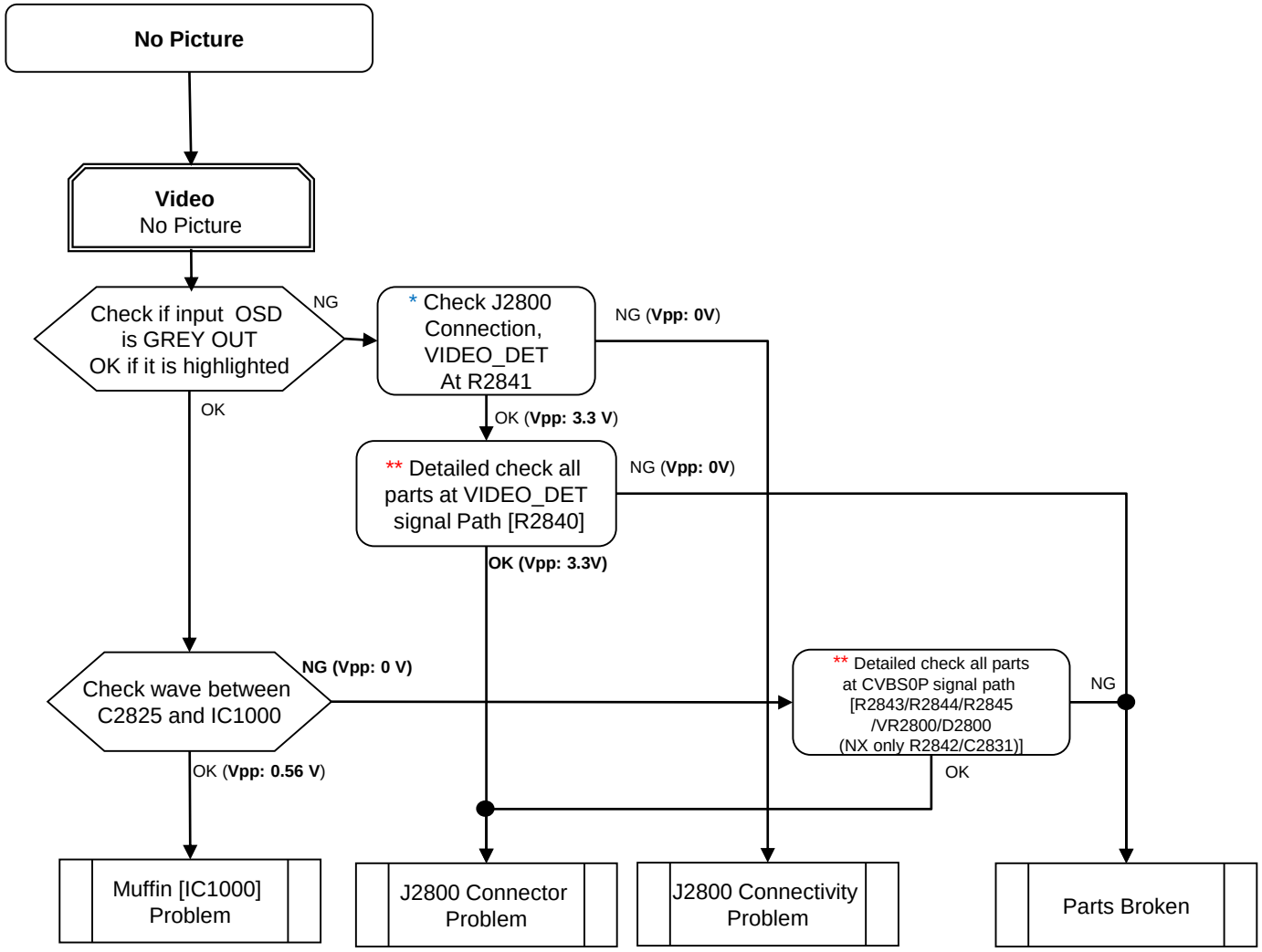
BM5S Board OLED Model



4.1 : Video Analog Signal Path



4.2 : No Picture (BM5/BM5S)


No Picture
Video
No Picture
Check if input OSD is GREY OUT OK if it is highlighted
NG
OK
* Check J2800 Connection, VIDEO_DET At R2841
NG (Vpp: 0V)
OK (Vpp: 3.3 V)
** Detailed check all parts at VIDEO_DET signal Path [R2840]
NG (Vpp: 0V)
OK (Vpp: 3.3V)
Check wave between C2825 and IC1000
NG (Vpp: 0 V)
OK (Vpp: 0.56 V)
** Detailed check all parts at CVBS0P signal path [R2843/R2844/R2845 /VR2800/D2800 (NX only R2842/C2831)]
NG
OK
Muffin [IC1000] Problem
J2800 Connector Problem
J2800 Connectivity Problem
Parts Broken

* → OK Condition : No solder splash can be seen
→ NG Condition : Solder splash can be seen

** → OK Condition : No part short-circuited
→ NG Condition : Part short-circuited

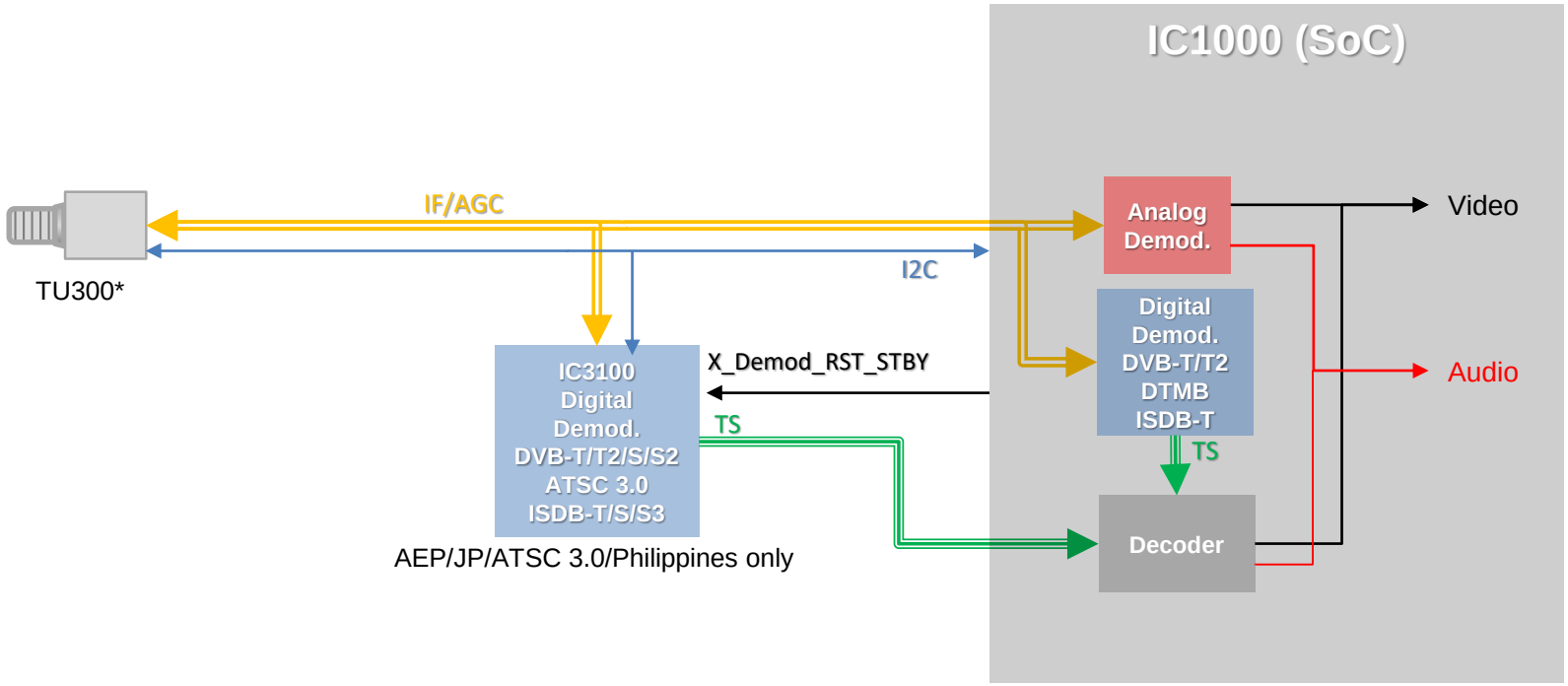
4.2/4.3 : Input Skip function (BM5/BM5S)

Condition	Actions to be taken
Muffin [IC1000] Problem	Refer to IC troubleshooting for further investigation
J2800 Connector Problem J2800 Connectivity Problem	Change Connector
Parts Broken	Change Part

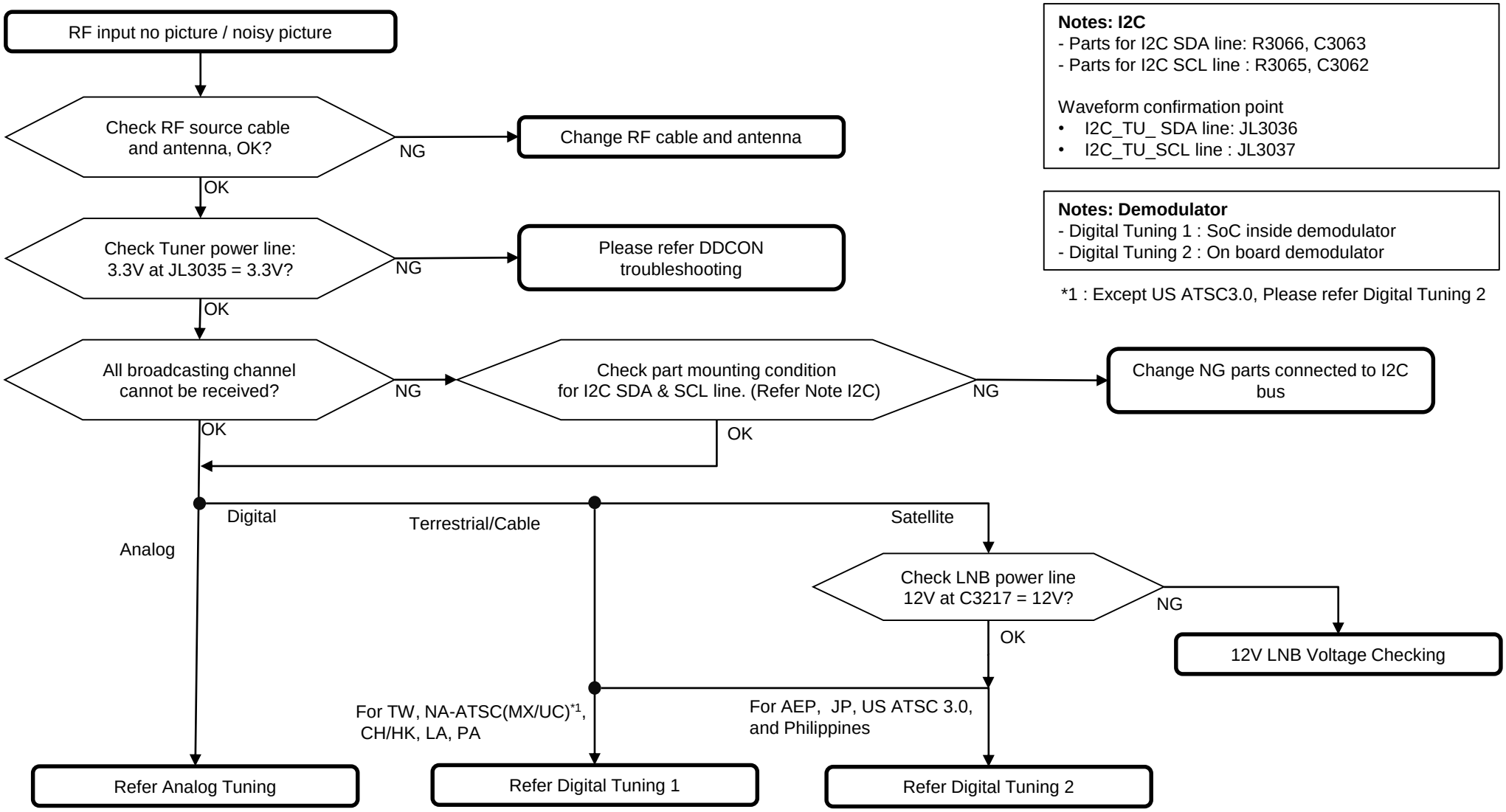
4.2/4.3 : Input Skip function (BM5/BM5S)

Input	Signal	Non-Detect (Typical)	Detect (Typical)
Video	VIDEO_DET IC1000 AH9-GPIO56	0V	3.3V

4.4 No Picture Tuner



4.4 No Picture Tuner



Notes: I2C
- Parts for I2C SDA line: R3066, C3063
- Parts for I2C SCL line : R3065, C3062

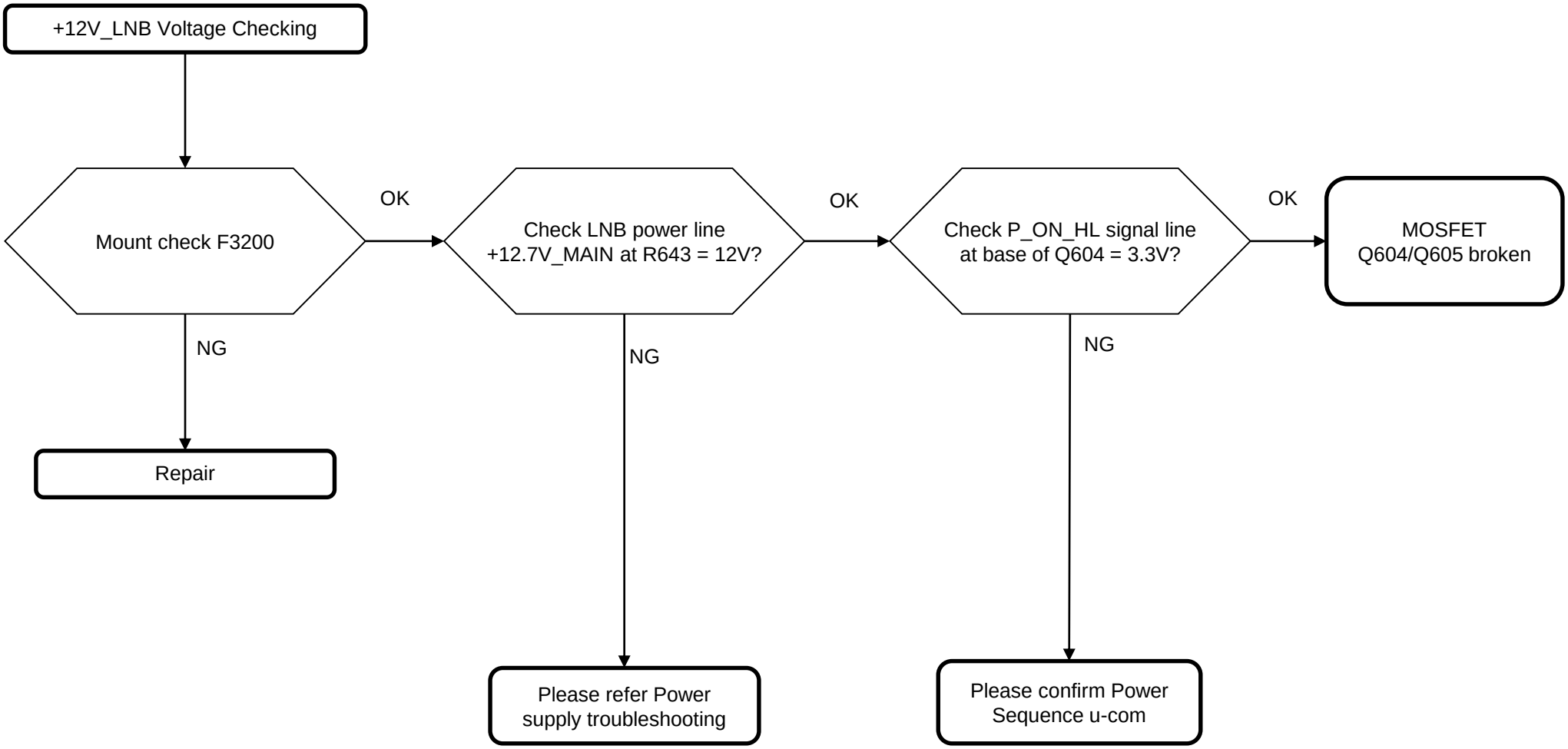
Waveform confirmation point
- I2C_TU_ SDA line: JL3036
- I2C_TU_SCL line : JL3037

Notes: Demodulator
- Digital Tuning 1 : SoC inside demodulator
- Digital Tuning 2 : On board demodulator

*1 : Except US ATSC3.0, Please refer Digital Tuning 2

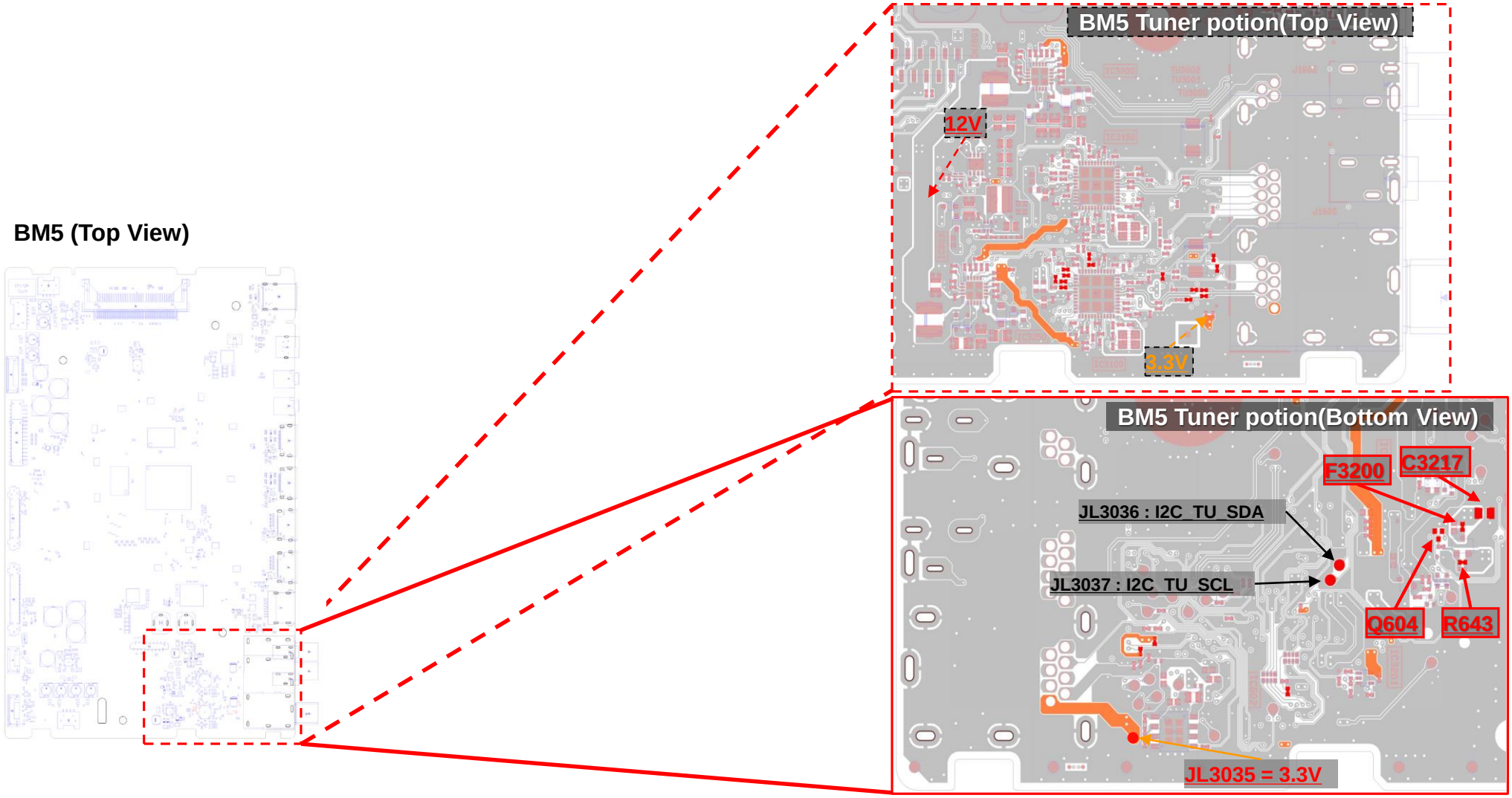
4.4 No Picture Tuner

FOR 12V LNB Voltage Checking: @ AEP and JP



4.4 No Picture Tuner (BM5)

BM5 (Top View)

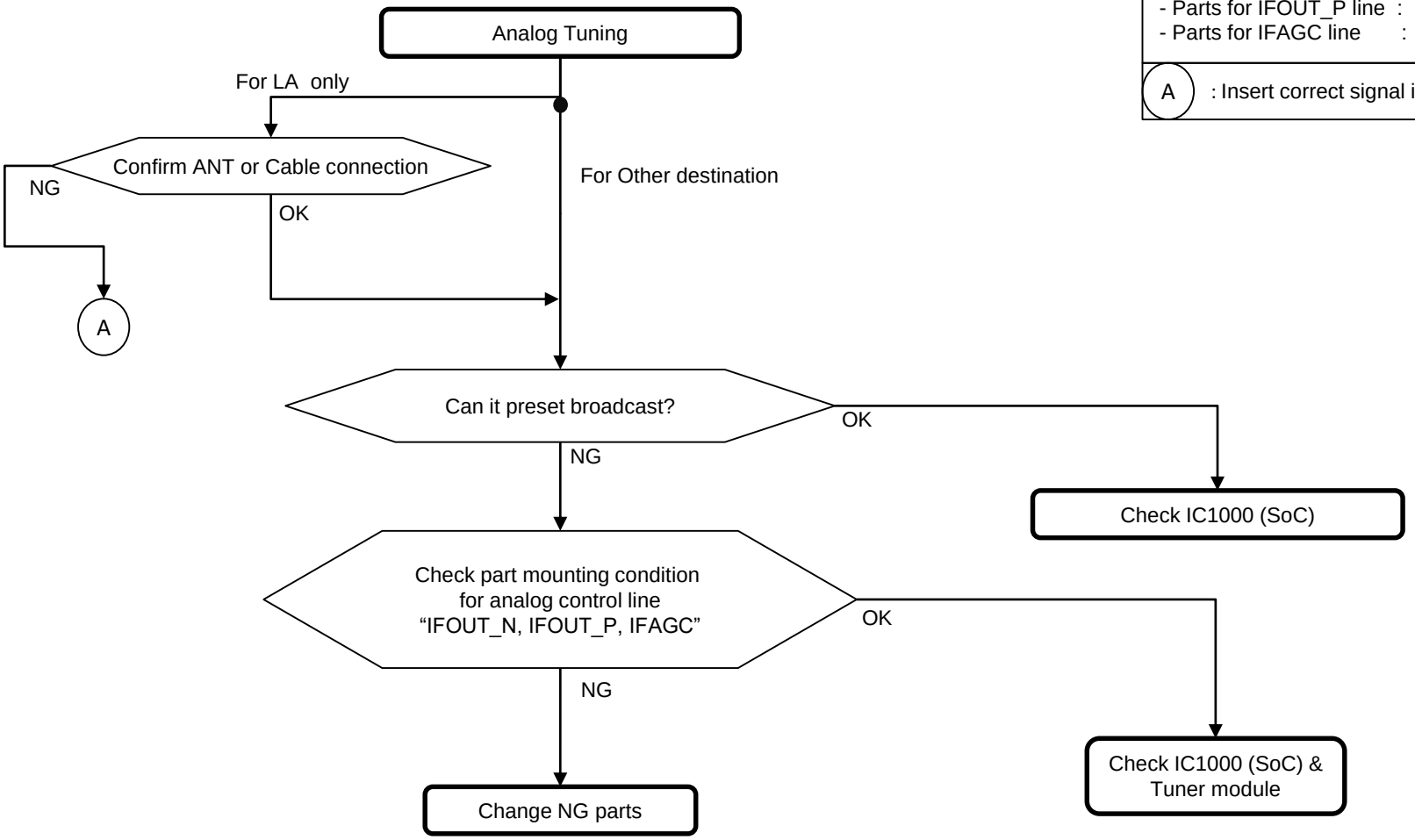


4.4 No Picture Tuner

FOR ANALOG TUNING: @ All destination except JP

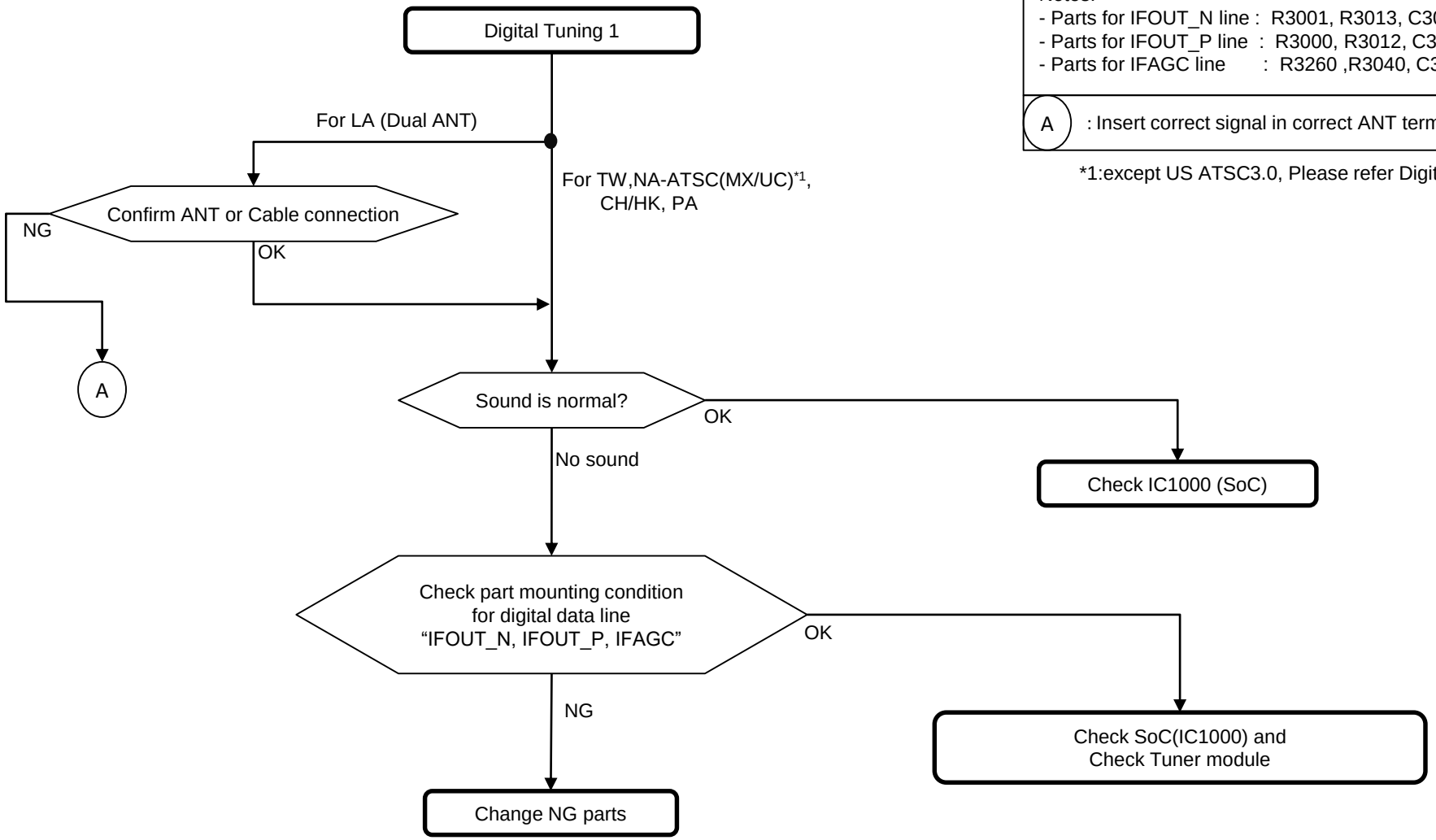
Notes:
- Parts for IFOUT_N line : R3001, R3013, C3011
- Parts for IFOUT_P line : R3000, R3012, C3010
- Parts for IFAGC line : R3260 ,R3040, C3004

A : Insert correct signal in correct ANT terminal.



4.4 No Picture Tuner

FOR DIGITAL TUNING 1: @ For TW, NA-ATSC(MX/UC)*1, CH/HK, LA, PA



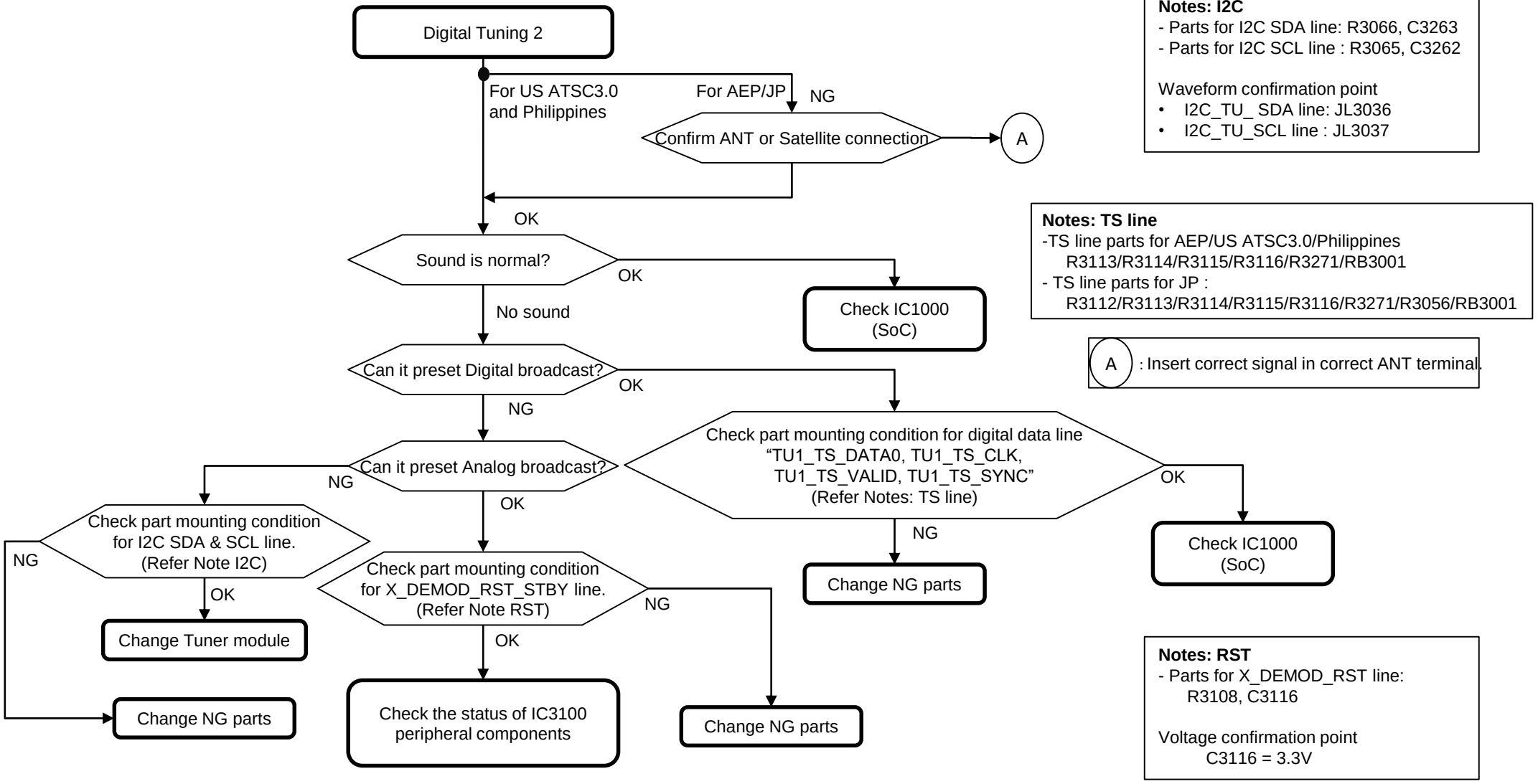
Notes:
- Parts for IFOUT_N line : R3001, R3013, C3011
- Parts for IFOUT_P line : R3000, R3012, C3010
- Parts for IFAGC line : R3260 ,R3040, C3004

A : Insert correct signal in correct ANT terminal.

*1:except US ATSC3.0, Please refer Digital Tuning 2

4.4 No Picture Tuner

FOR DIGITAL TUNING 2: @ AEP, JP, US ATSC3.0 and Philippines



Notes: I2C
- Parts for I2C SDA line: R3066, C3263
- Parts for I2C SCL line : R3065, C3262

Waveform confirmation point
- I2C_TU_ SDA line: JL3036
- I2C_TU_SCL line : JL3037

Notes: TS line
-TS line parts for AEP/US ATSC3.0/Philippines
R3113/R3114/R3115/R3116/R3271/RB3001
- TS line parts for JP :
R3112/R3113/R3114/R3115/R3116/R3271/R3056/RB3001

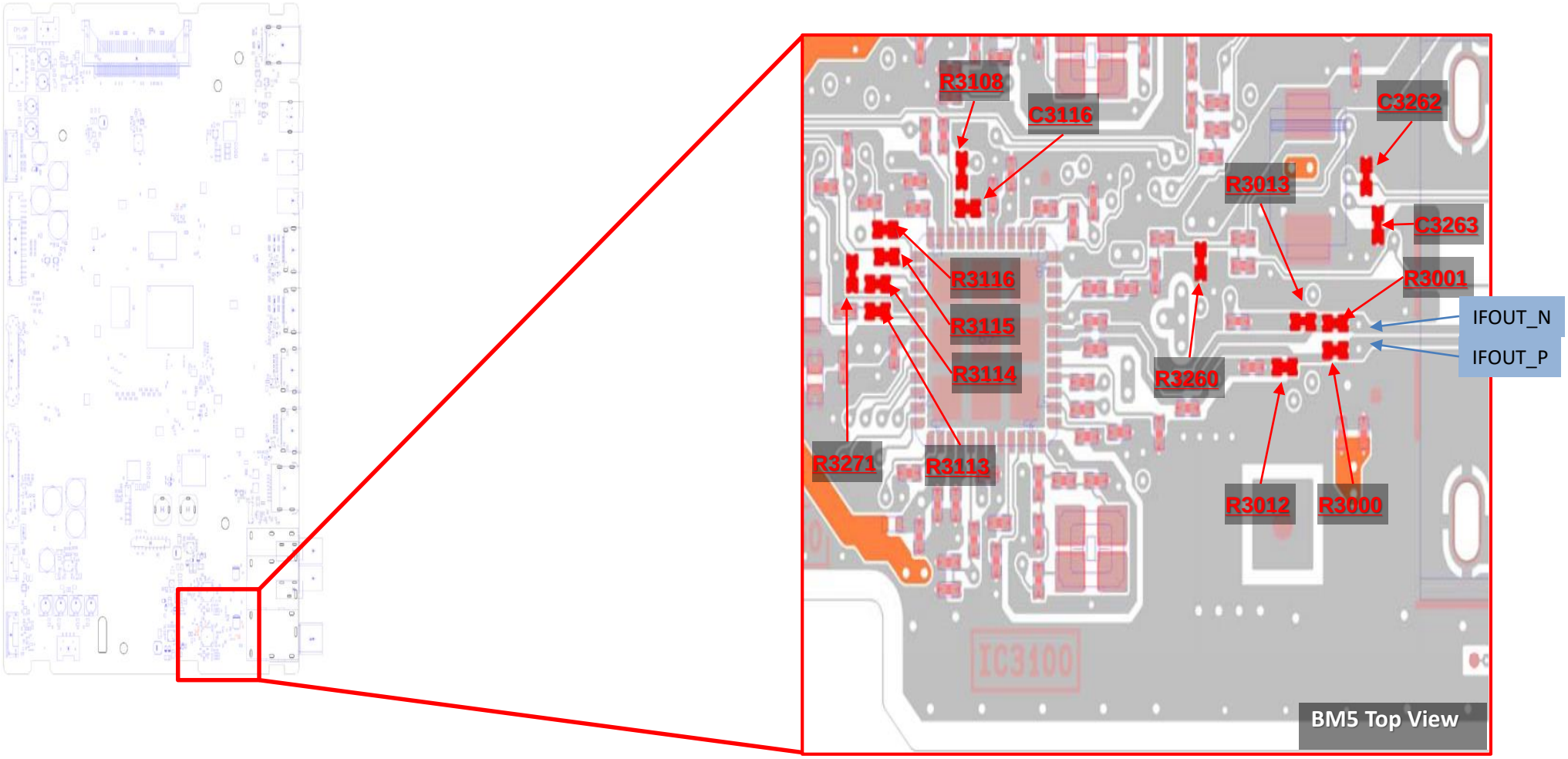
A : Insert correct signal in correct ANT terminal.

Notes: RST
- Parts for X_DEMOD_RST line:
R3108, C3116

Voltage confirmation point
C3116 = 3.3V

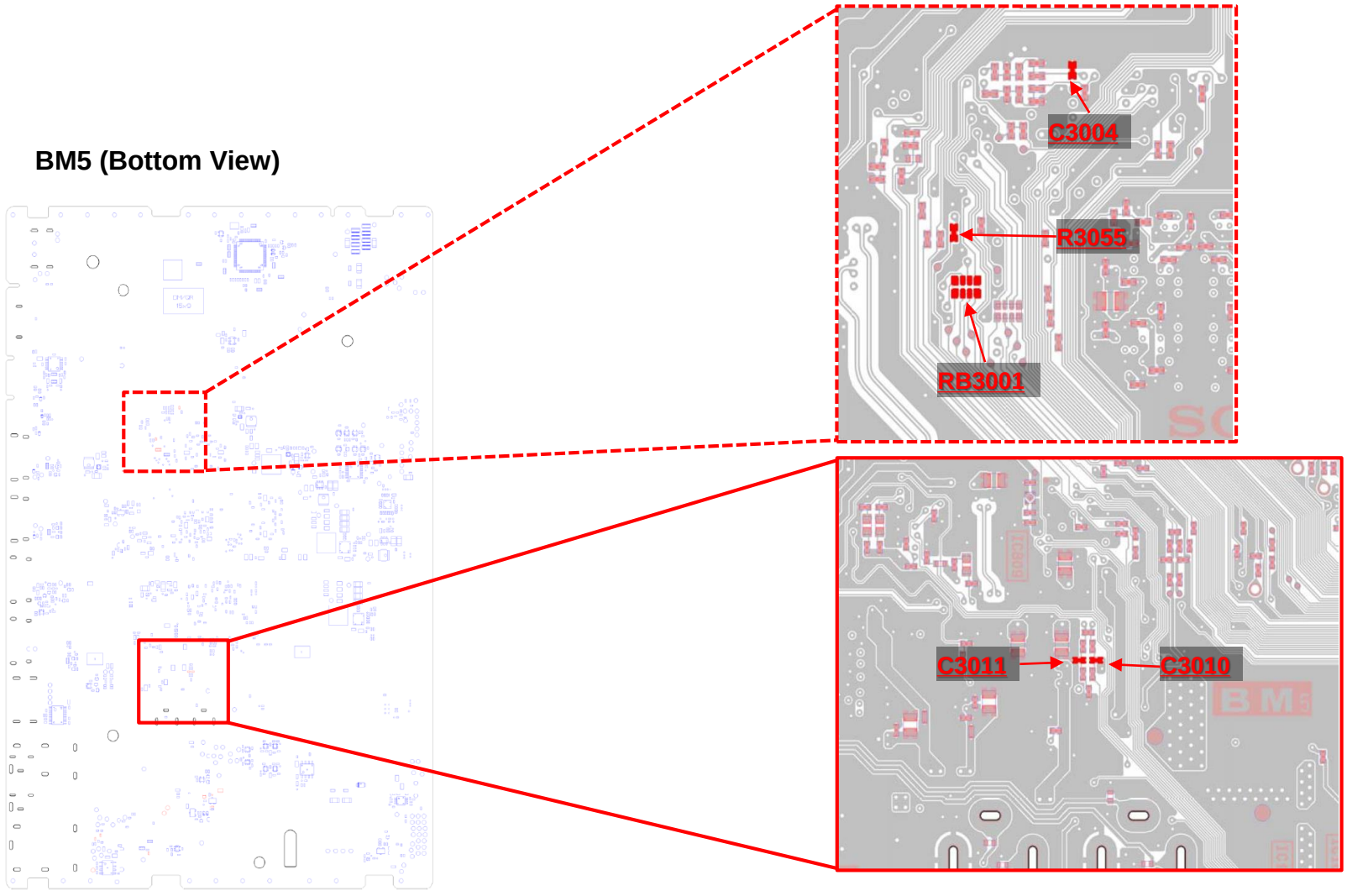
4.4 No Picture Tuner (BM5)

BM5(Top View)



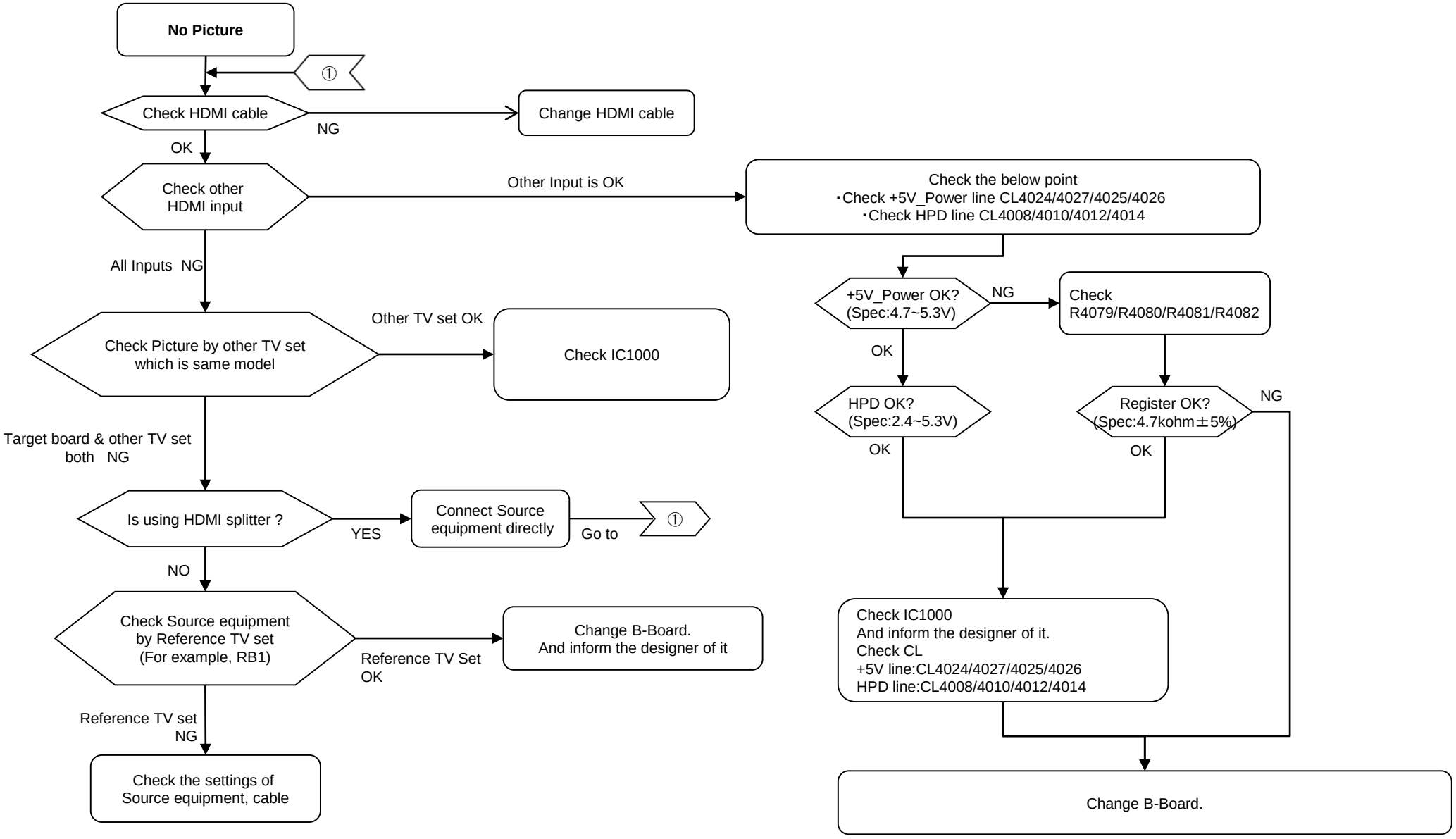
4.4 No Picture Tuner (BM5)

BM5 (Bottom View)

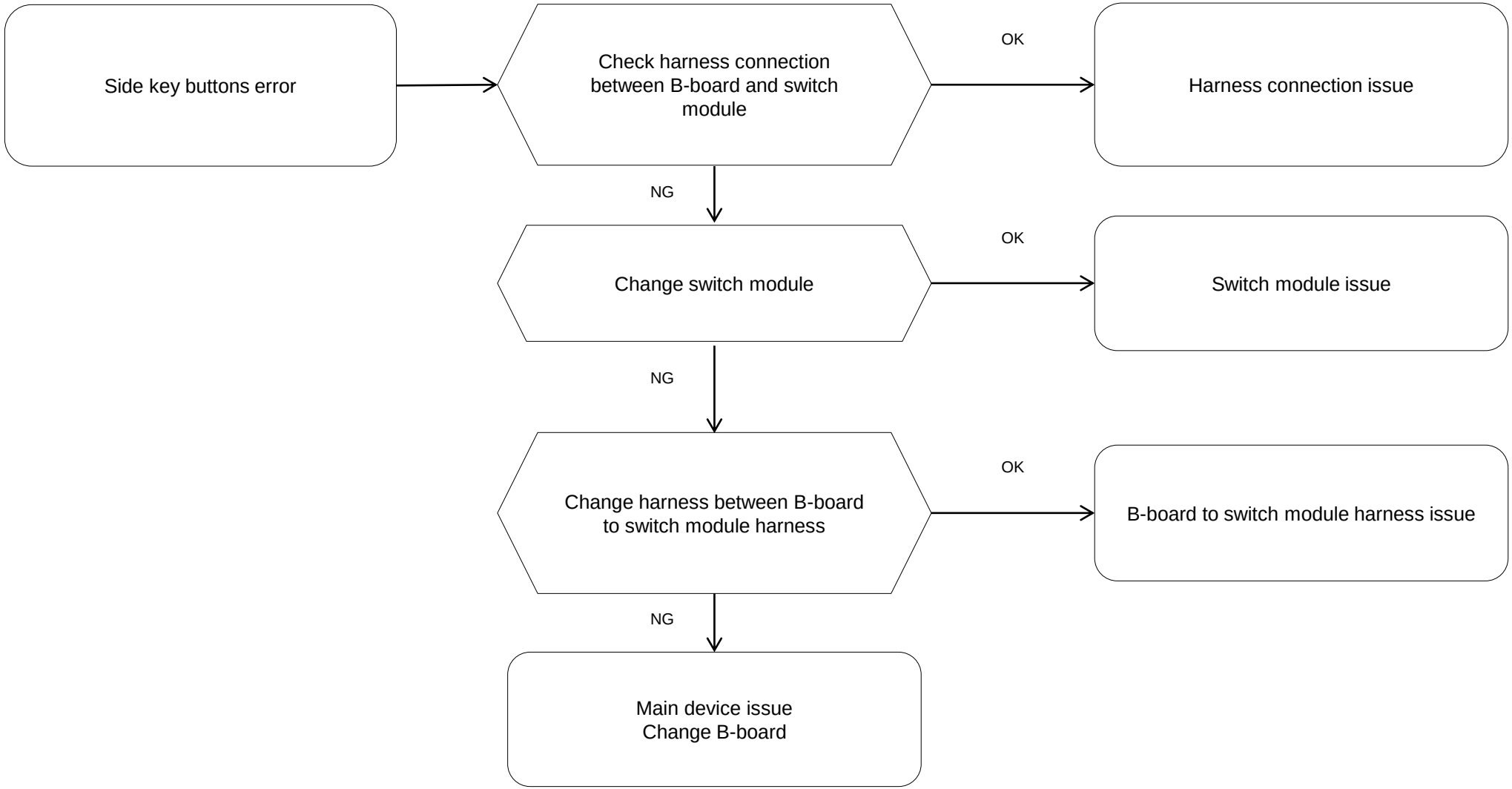


BM3J19 Bottom View

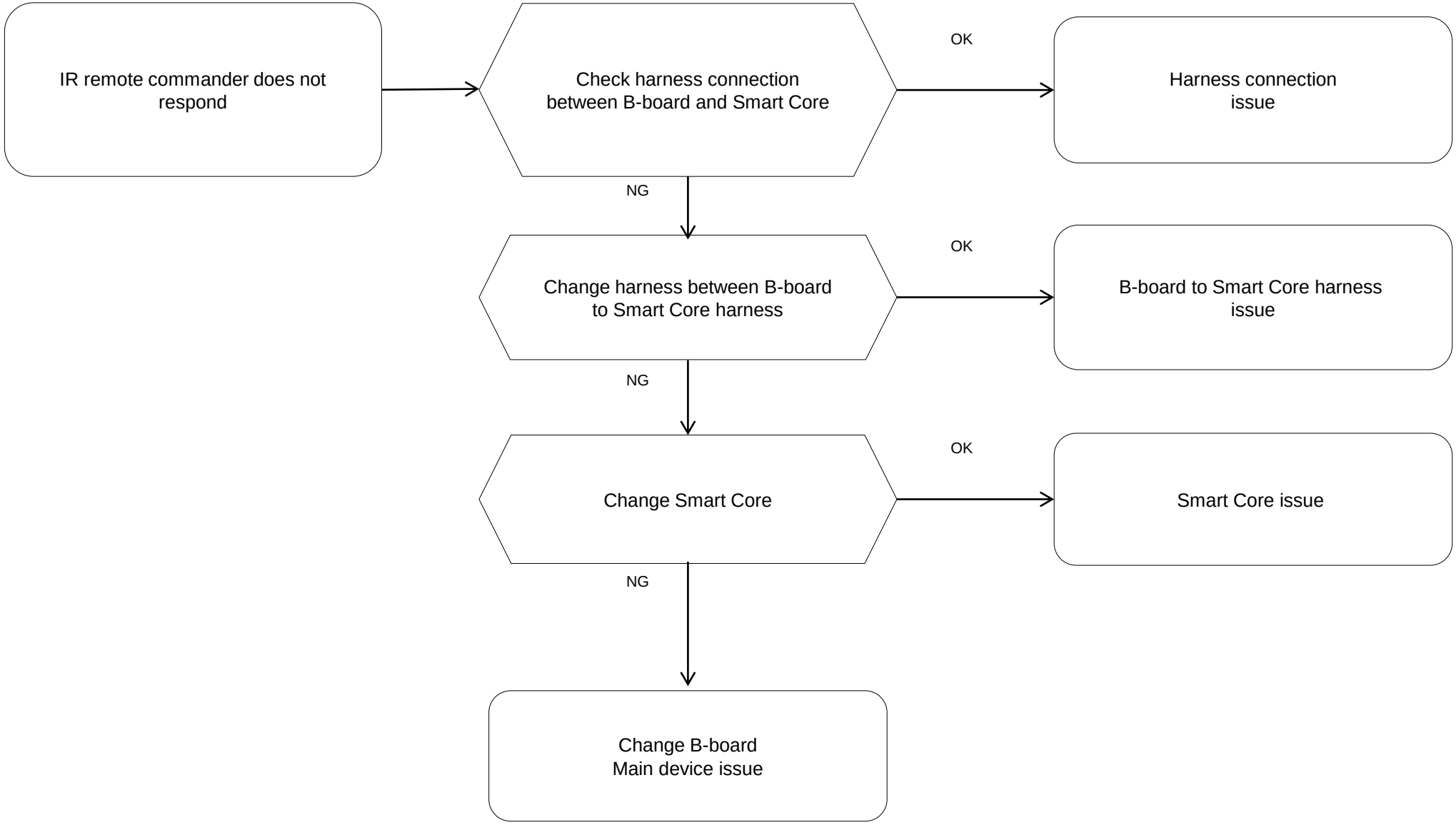
4.5 No Picture : HDMI 1/2/3/4



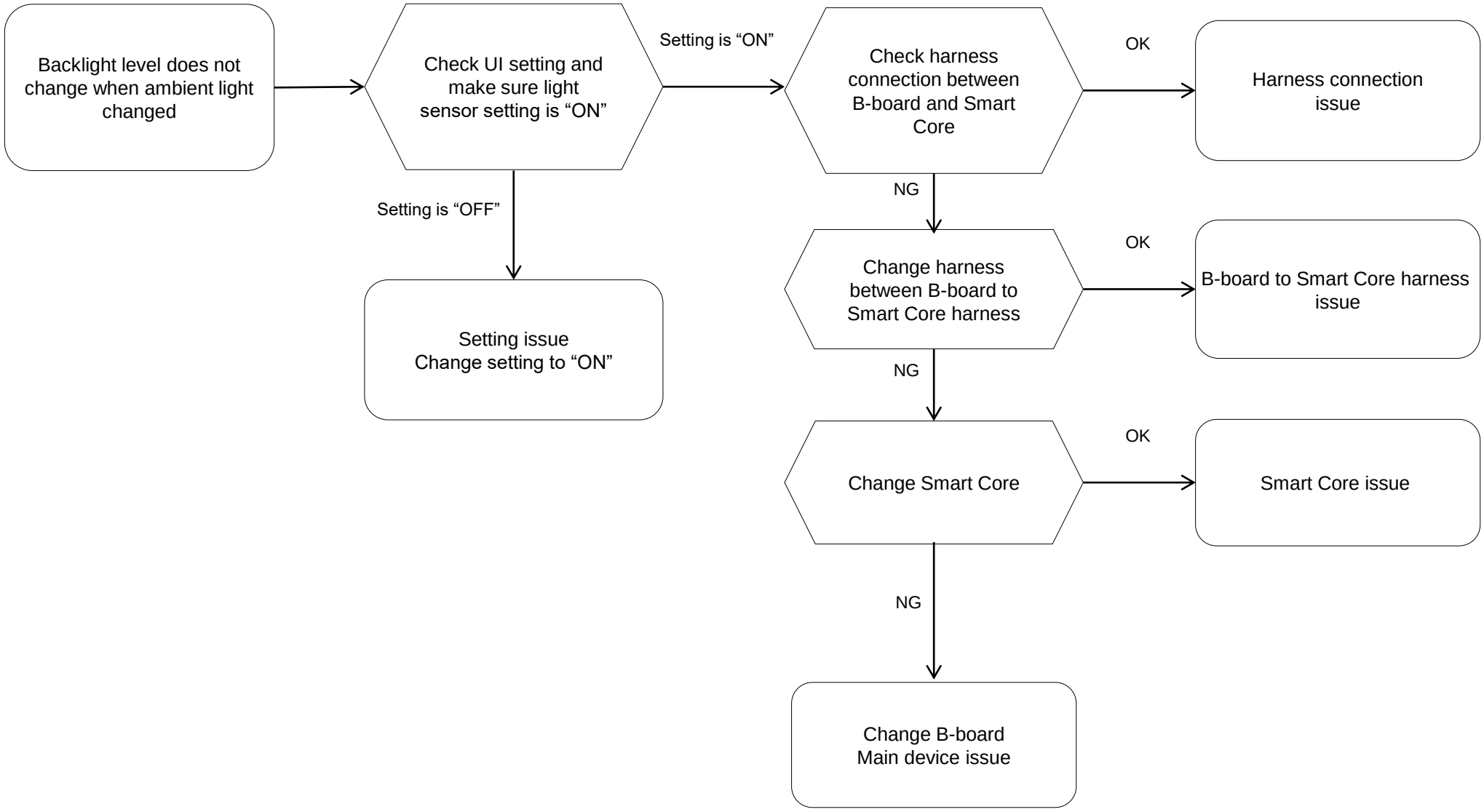
5.0 Key Switch Buttons Error



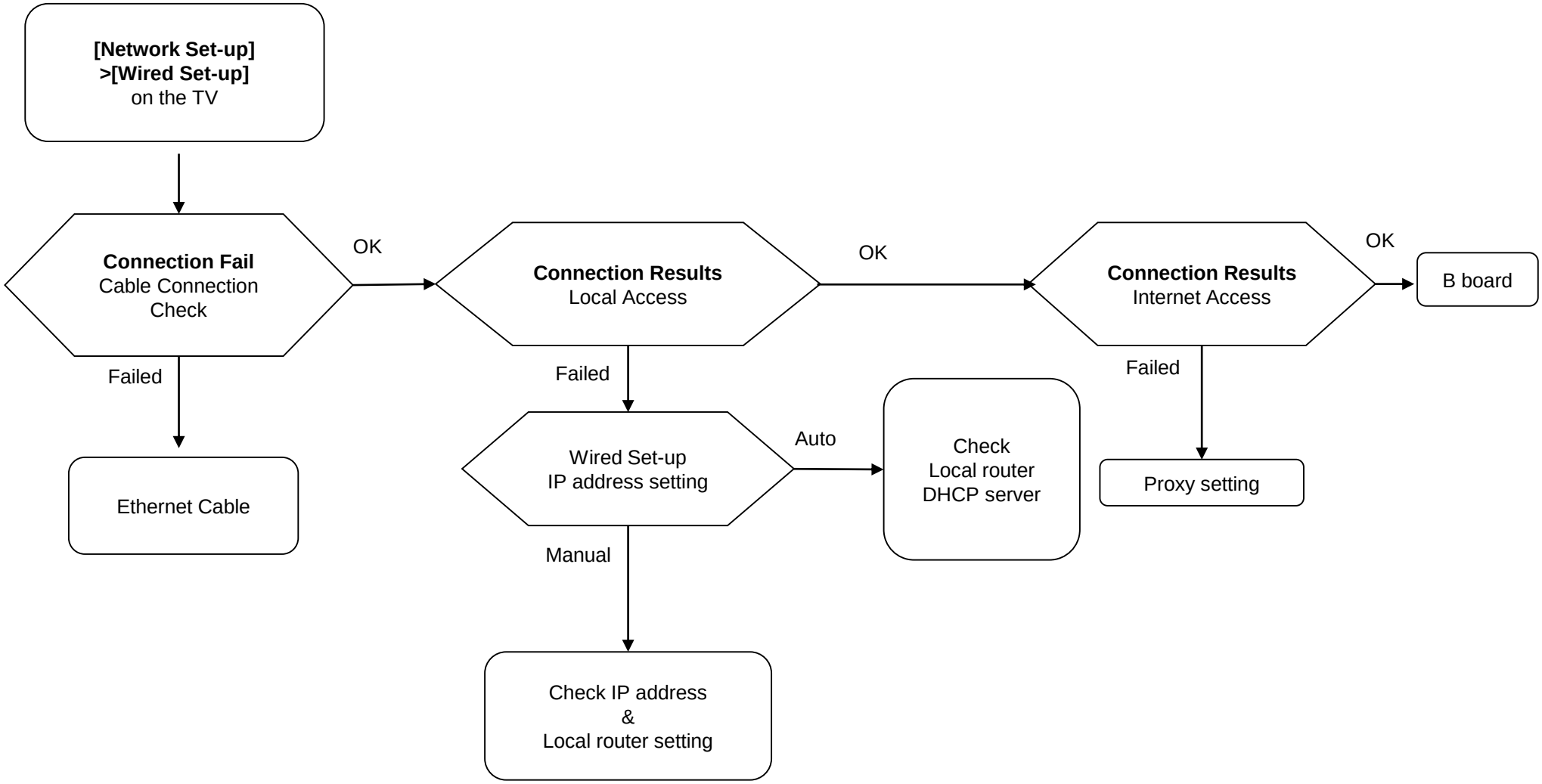
5.1 IR Remote Commander Error



5.2 Light Sensor Error

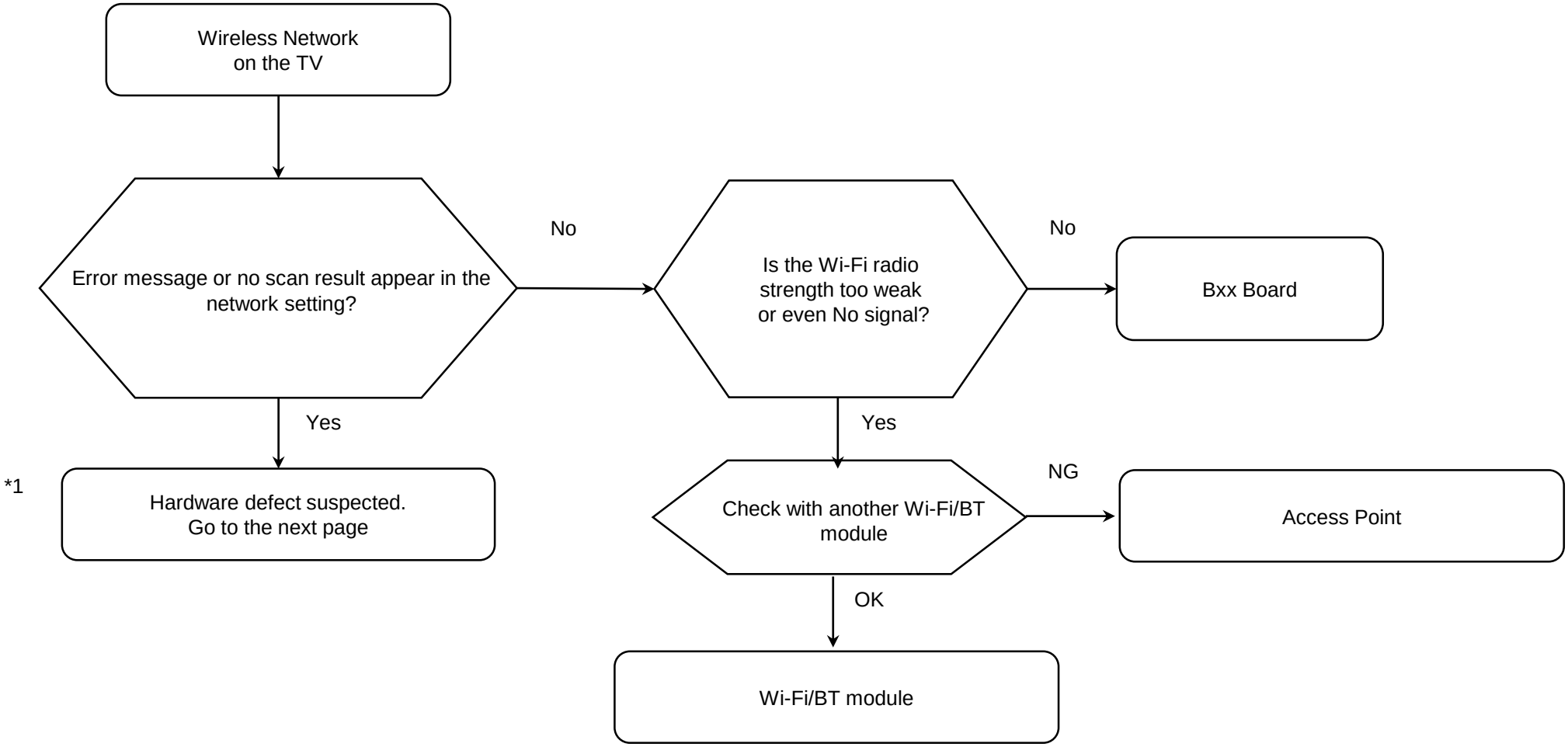


6.0 Network Malfunction : Ethernet (Wired)

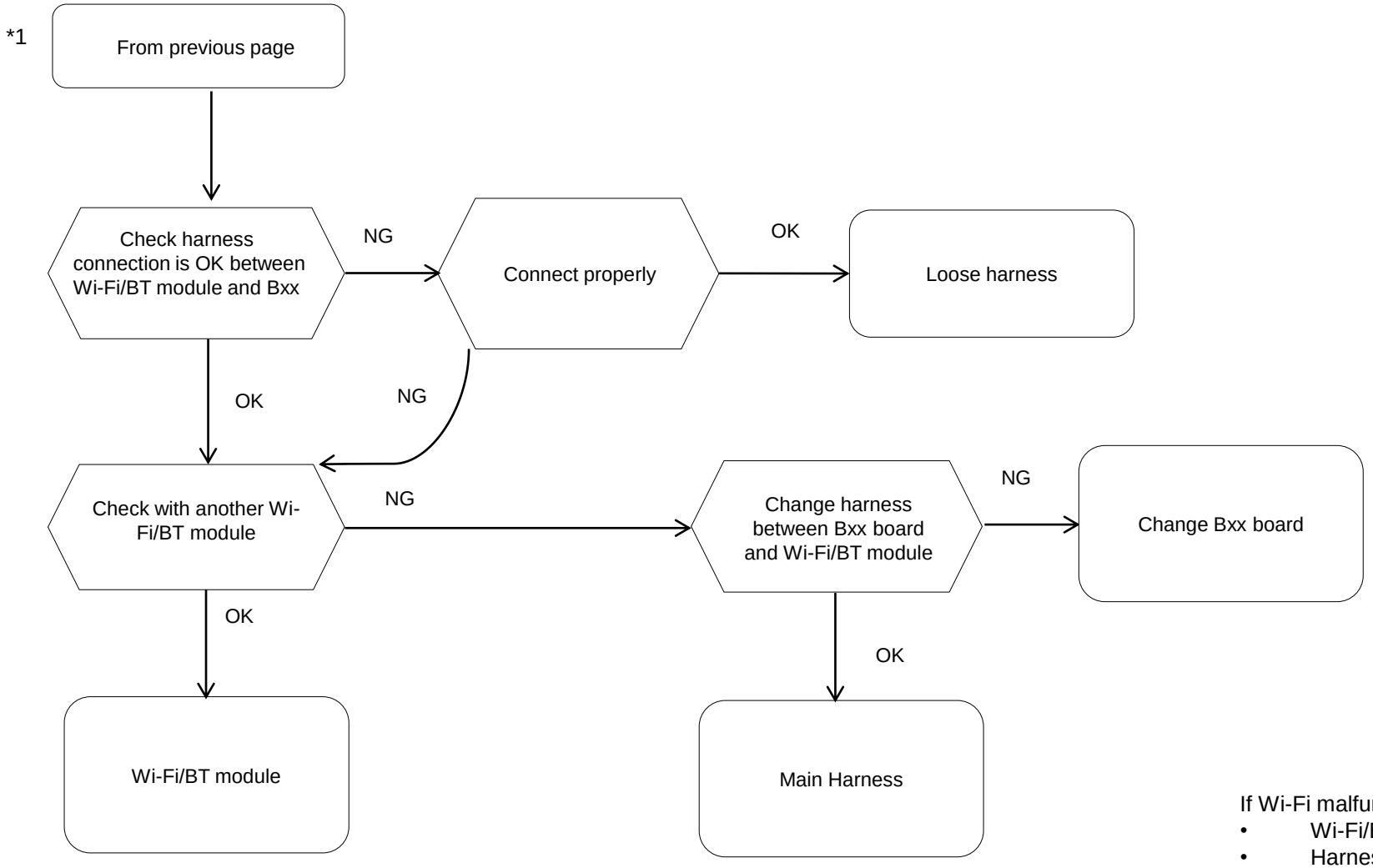


6.2 Wireless Network malfunction (1/2)

1) Internal Wireless Network malfunction



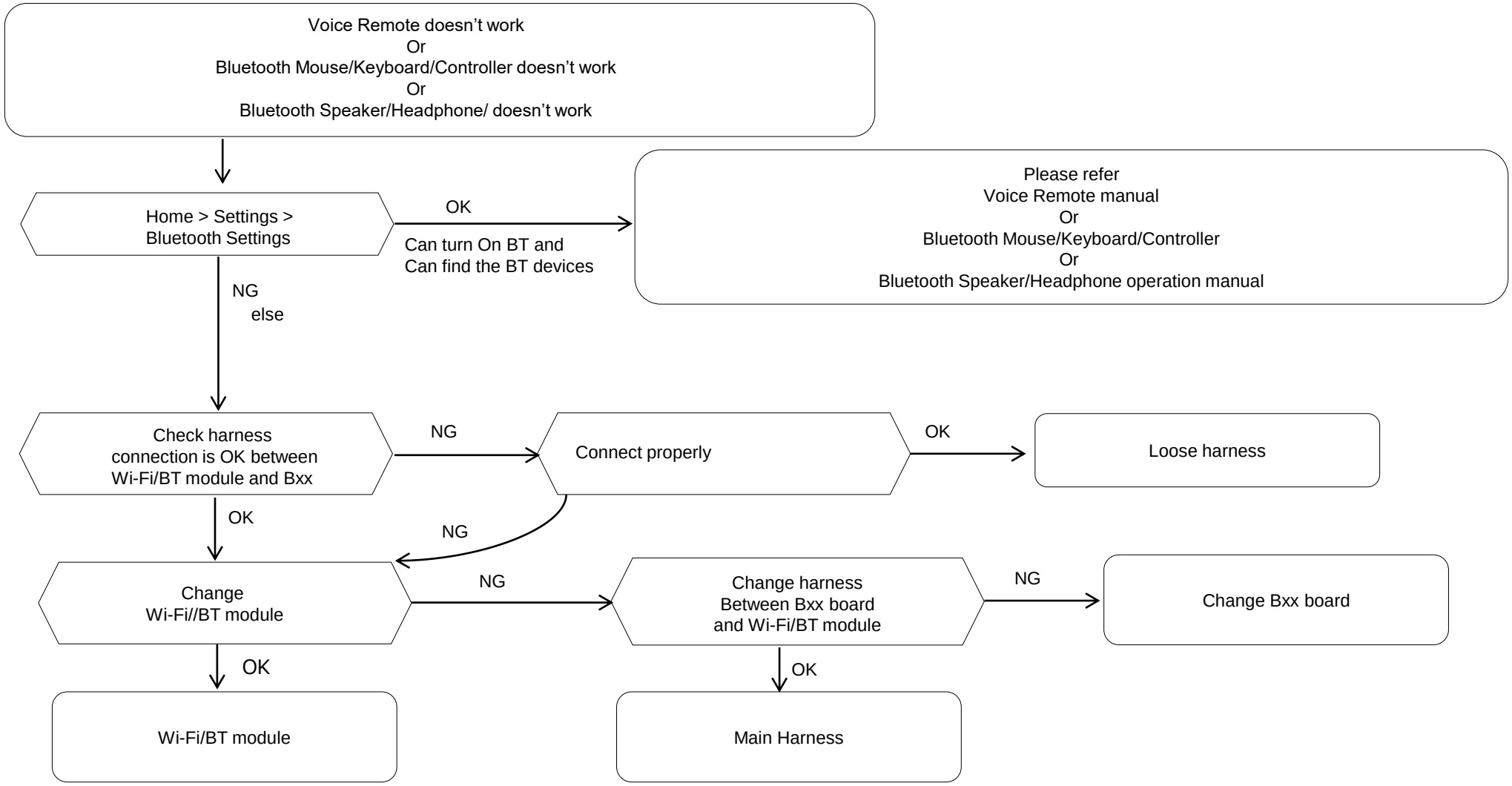
6.2 Wireless Network malfunction (2/2)



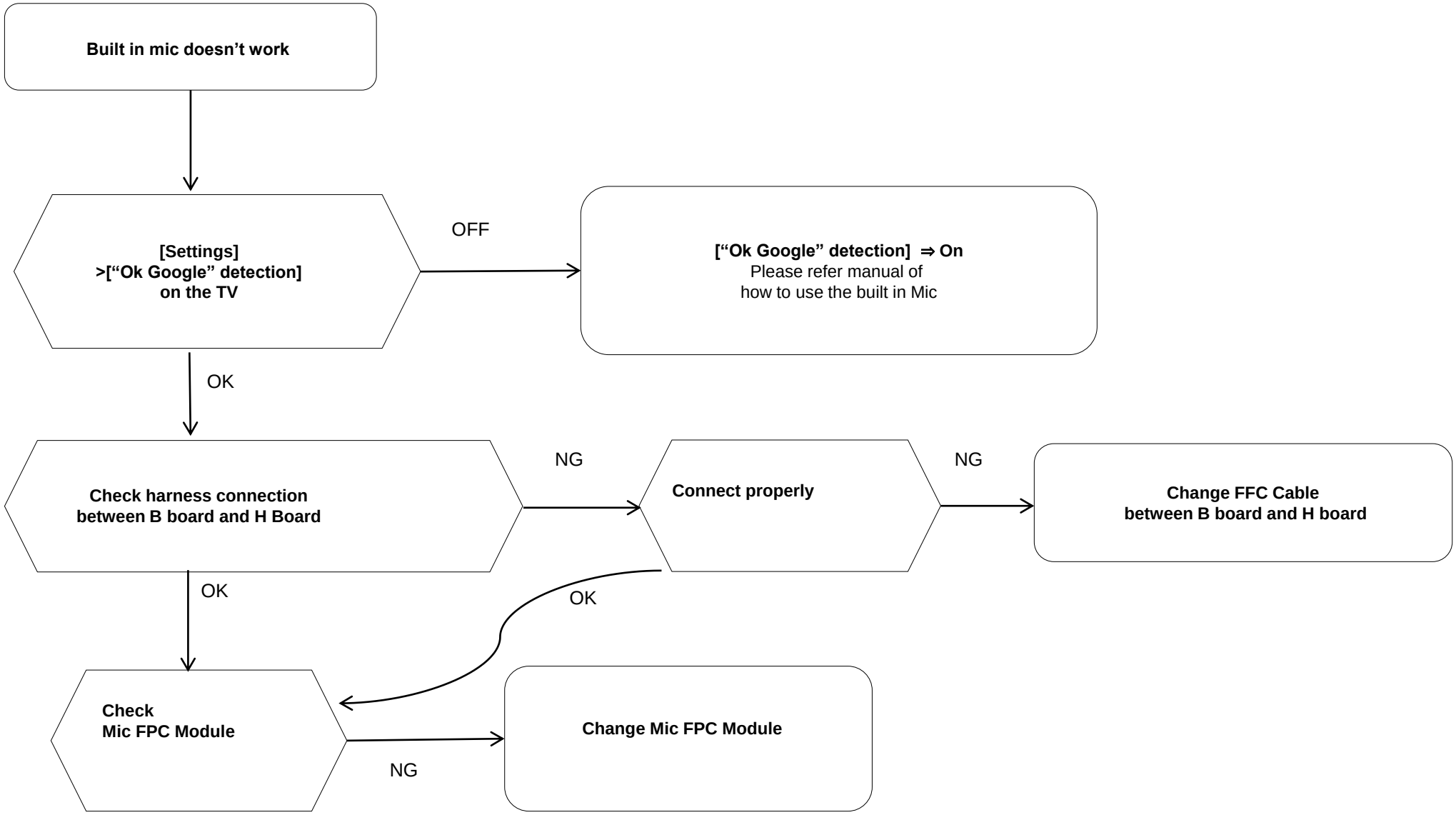
If Wi-Fi malfunction happens,
- Wi-Fi/BT module
- Harness between Wi-Fi/BT and Bxx
- Bxx board

are suspected.

6.3 Bluetooth malfunction



6.4 Built in Mic Malfunction



SECTION 4
SERVICE ADJUSTMENT

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When finished the operation of service mode, please AC Plug OFF/ON to the TV set.

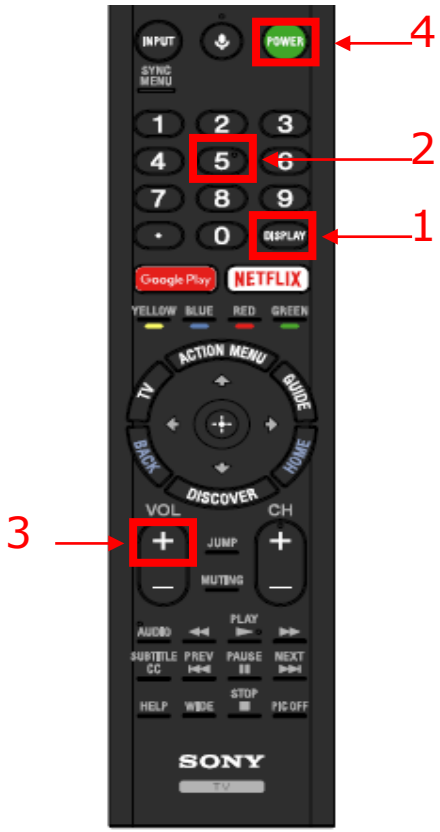
*If you do not plug AC OFF/ON, the Service Mode App will be remained and user can see the Service Mode after RC ON.

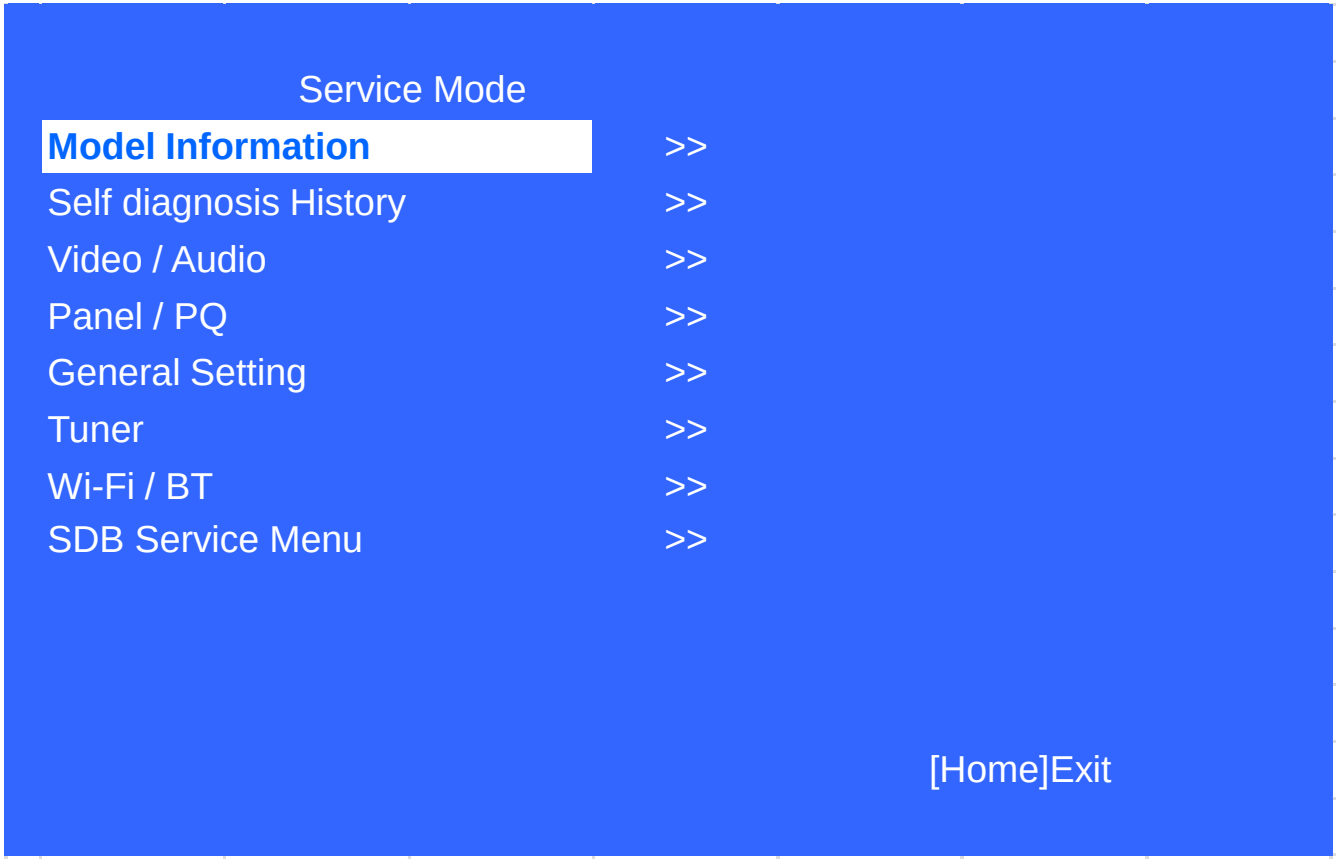
4.1 How to Enter Service Mode

From Standby Mode

1. Go to TV standby condition by remote commander.
2. Press “Display or i+ (info)”, “5”, “Volume+” then “TV power” on remote.
3. You can see Service menu on display.

For China Models :
Please use FY19 remote (or older) to enter to Service Mode.





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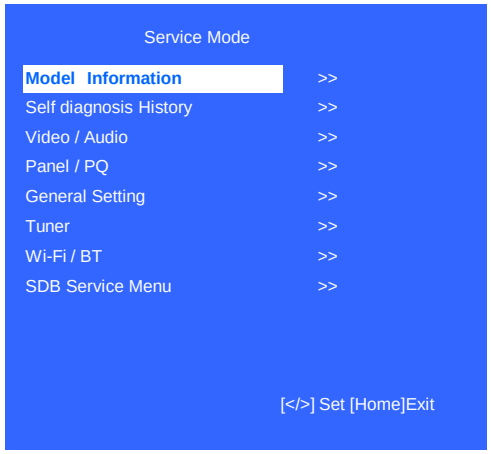
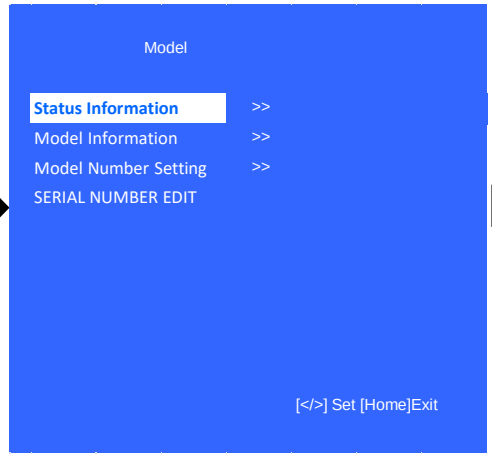
Summary of Service Control

Function	The flow of control
Service mode on	<Display or i+(info)> <5> <Vol. Up> <Power>
Close Service menu	<Home>
Service mode off	AC plug OFF
Item up / down	<↑> / <↓>
Item select left/right	<←> / <→>
Execute	<Enter>

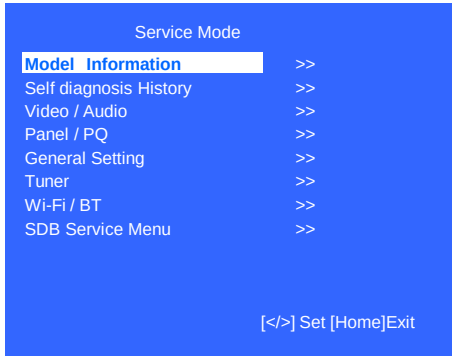
Software Version

1) In Service Mode, select “Model Information”, press “Enter” or → button to enter **Status Information**





2) Press “Enter” or “BACK” button to return to Service Mode



Serial Number Edit (1)

1) In “Service Mode”, select “Model Information” by pressing “↑” or “↓” then pressing “Enter” or “→” button to enter inside.

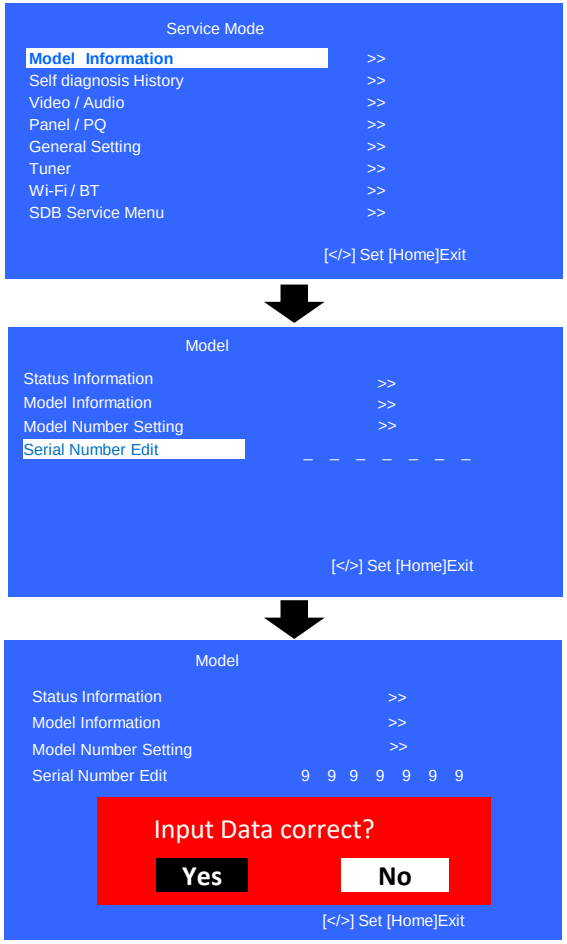
2) Select “Serial Number Edit” by pressing “↑” or “↓” button then pressing “→” button

3) Press “↑” or “↓” to input numbers

4) After user input data , press <Enter>
   - Pop-up dialog appear to confirm input data correct
   - **Serial Number can be set ONLY ONCE**

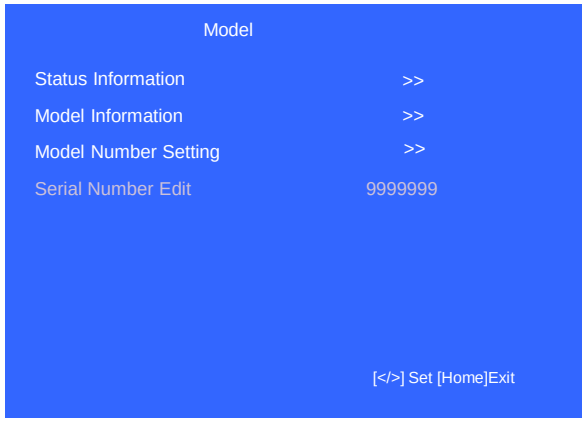
5) Press “→” or “←” button to select YES or NO. Select YES if input data is correct. Select NO if input data is incorrect. Press <Enter> to save answer.

* The font color of YES/NO is change to black when it is selected.

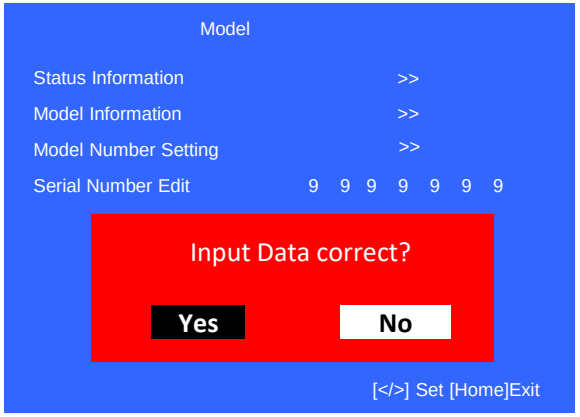


Serial Number Edit (2)

If YES is selected, the input data is saved into EEPROM. SERIAL NUMBER EDIT is greyed out and the serial number that has been input is displayed. Operator will not able to edit anymore.



If NO is selected, the input data is not saved into EEPROM. The serial number that has been input is displayed. Operator can still edit the Serial Number.



*The font color of YES/NO is change to black when it is selected.

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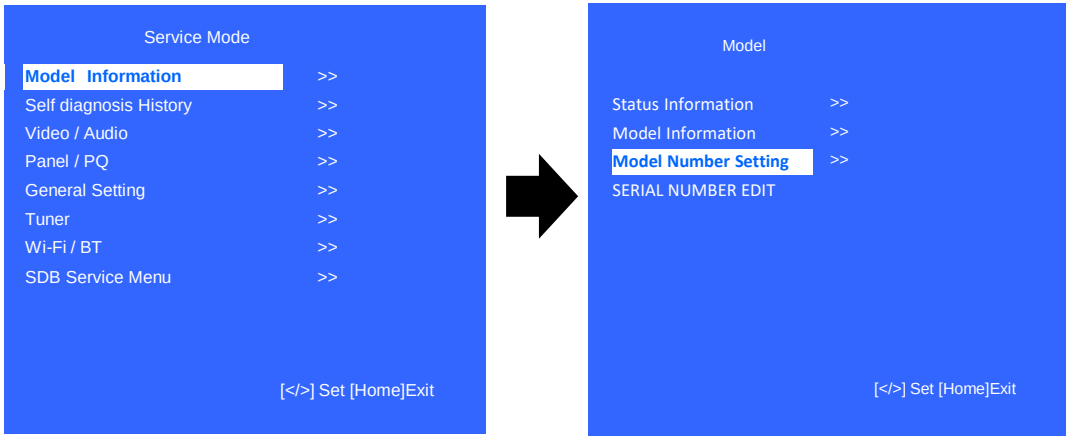
Model Number Setting

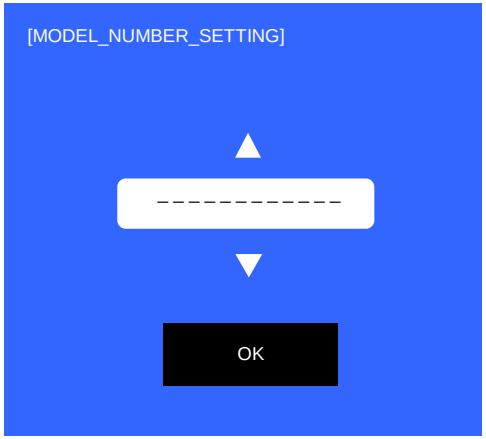
1) In “Service Mode”, select “Model Information” by pressing “↑” or “↓” then pressing “Enter” or “→” button to enter inside.

2) Select “Model Number Setting” by pressing “↑” or “↓” button then pressing “Enter” or “→” button

3) Press “↑” or “↓” arrow key to scroll Product Name Candidate. (e.g. KD-65XF9005 CEI)

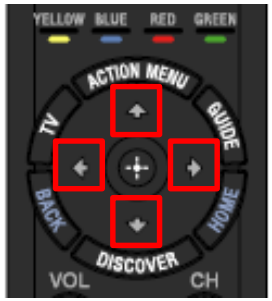
4) Select one Product Name from the list. After that select “[OK]” and press “Enter” button.



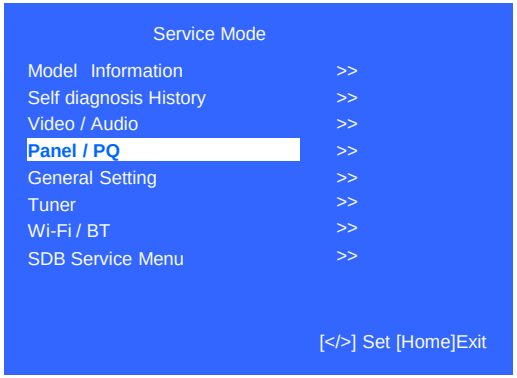


WB Adjustment (If necessary)

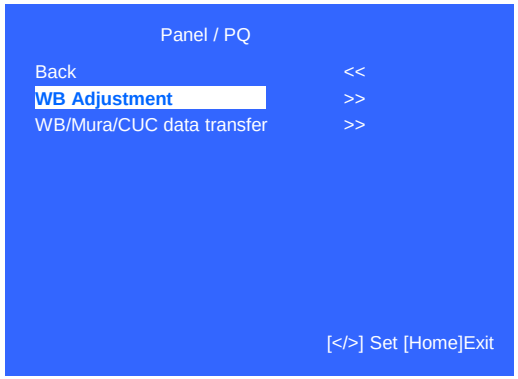
1. In **"Panel/PQ"** service mode
   a. Go to **"WB Adjustment"** category by "↑" or "↓".
   b. To select **"WB Adjustment"**, press → button.
   c. To change data , press "←" or "→" on remote commander.



a.



b.



c.

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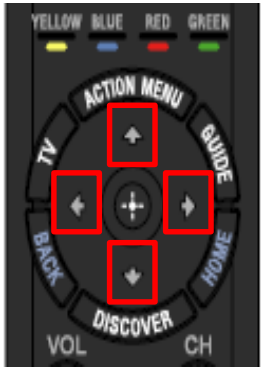
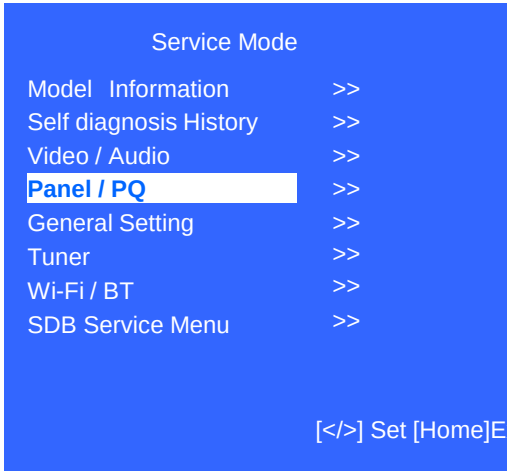
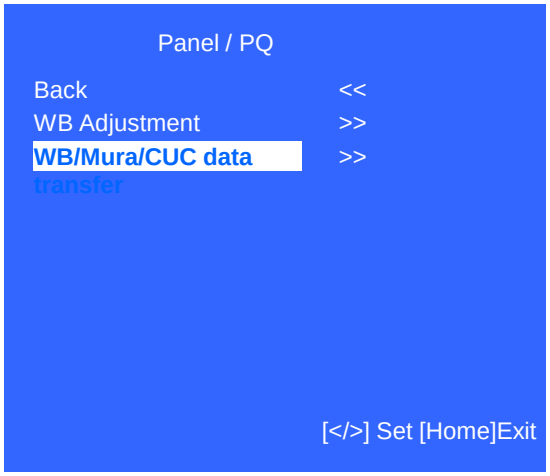
WB/Mura/CUC data transfer (LCD Model only)

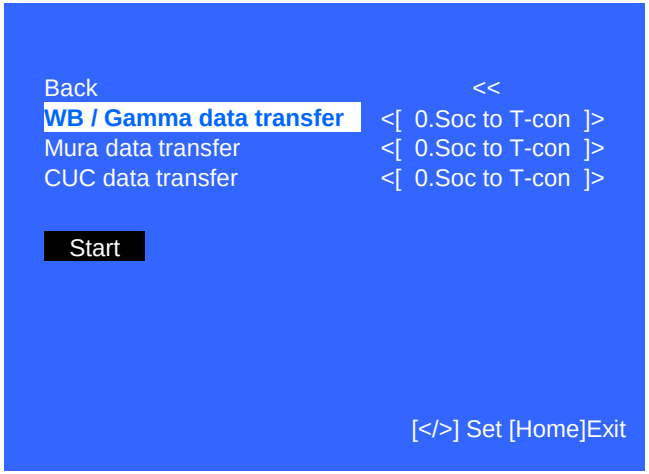
Please apply Main board or panel is replaced.

1. In **"Panel/PQ"** service mode
   a. Go to **"WB/Mura/CUC data transfer"** category by "↑" or "↓".
   b. To select **"WB/Mura/CUC data transfer"**, press → button.
   c. To change data , press "←" or "→" on remote commander.







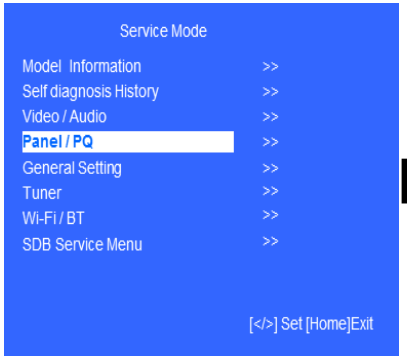


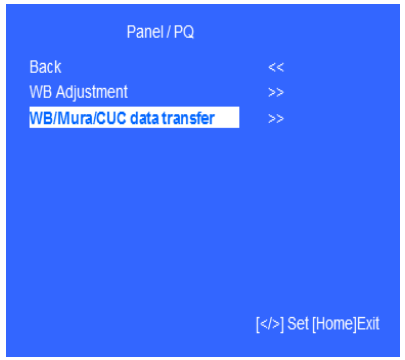
2. In **"WB/Mura/CUC data transfer"**
   a. Select "**WB/Gamma data transfer**" by pressing "↑" or "↓" on remote commander .
   b. To change the items, press "←" or "→" on remote commander and press "Enter" button.
      Selectable items are:
      - 0. SoC to T-con (Only T-con is replaced)
      - 1. T-con to SoC (Main board or Panel is replaced)
      - 2. Not action
   c. Similarly, to select the items in Mura and CUC data.
   d. Select "[start]" and press "Enter" button to start transfer.

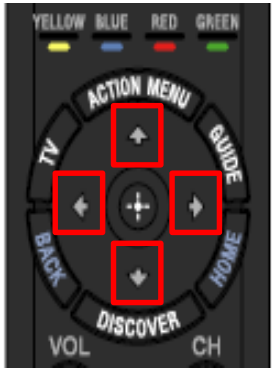
WB data transfer (OLED only)

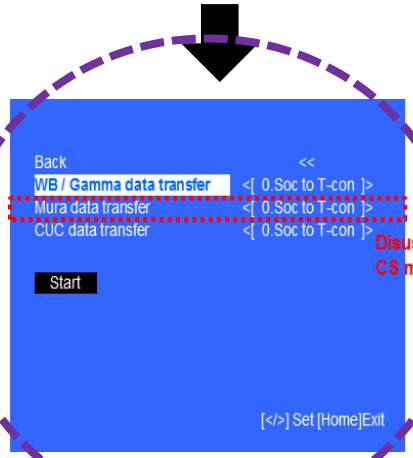
Please apply Main board or panel is replaced.

1. In **“Panel/PQ”** service mode
   a. Go to **“WB/Mura/CUC data transfer”** category by “↑” or “↓”.
   b. To select **“WB/Mura/CUC data transfer”**, press → button.
   c. To change data , press “←” or “→” on remote commander.









Disuse in CS model

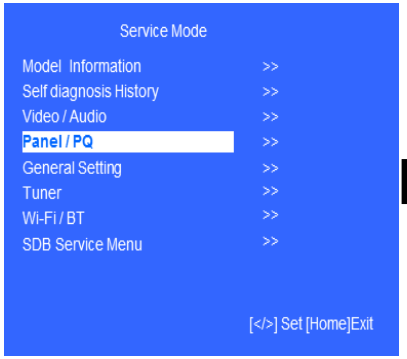
2. In **“WB/Mura/CUC data transfer”**
   a. Select “**WB/Gamma data transfer**” by pressing “↑” or “↓” on remote commander .
   b. To change the items, press “←” or “→” on remote commander and press “Enter” button.
   Selectable items are:
   - 0. SoC to T-con
   - 1. T-con to SoC
   - 2. No action

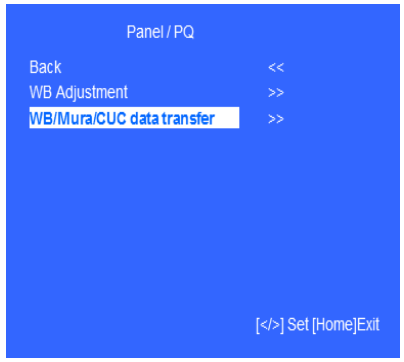
   c. “Mura data transfer” is also displayed on the menu, but Mura function does not work on OLED model.
   CUC function can work. (refer to next page).
   Please skip these items by pressing “↓” on remote commander .
   d. Select “[start]” and press “Enter” button to start transfer.

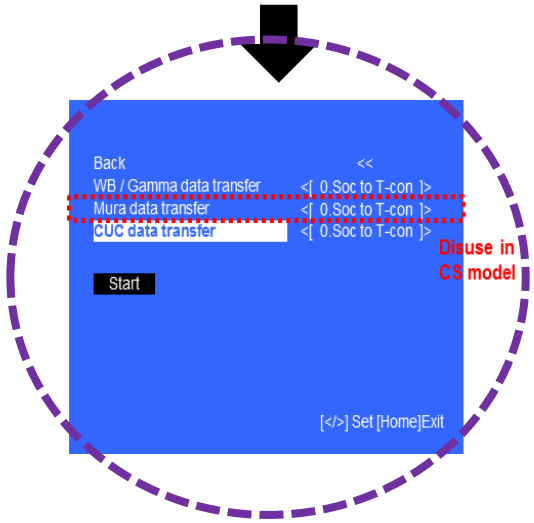
CUC data transfer (OLED only)

Please apply Main board or panel is replaced.

1. In **“Panel/PQ”** service mode
   a. Go to **“WB/Mura/CUC data transfer”** category by “↑” or “↓”.
   b. To select **“WB/Mura/CUC data transfer”**, press → button.
   c. To change data , press “←” or “→” on remote commander.







2. In **“WB/Mura/CUC data transfer”**
   a. Select “**CUC data transfer**” by pressing “↑” or “↓” on remote commander .
   b. To change the items, press “←” or “→” on remote commander and press “Enter” button.
   Choose
   ▪ 1. T-con to SoC
   and press “Enter” button.
   c. “Mura data transfer” is also displayed on the menu, but Mura function does not work on OLED model.
   Please skip this item by pressing “↓” on remote commander .
   d. Select “[start]” and press “Enter” button to start transfer.

HDD Performance Check (EU only)

1) In “Service Mode”, select “General Setting” by pressing “↑” or “↓” then pressing “Enter” or “→” button to enter inside.

2) Select “HDD Performance check ” by pressing “↑” or “↓” then pressing “Enter” or “→” button to enter inside.

3) A message "Please wait ..." is displayed during performance check processing.

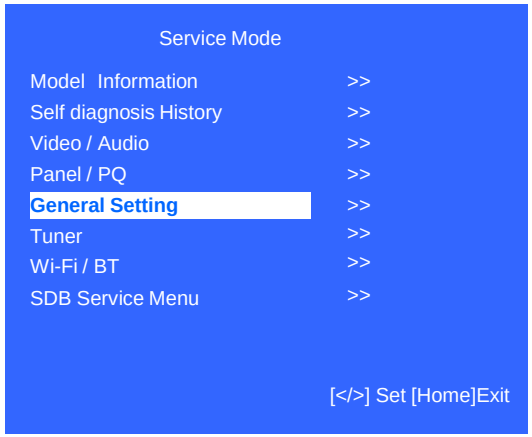
4) Result **OK** or **NG** will be displayed after performance of HDD is checked

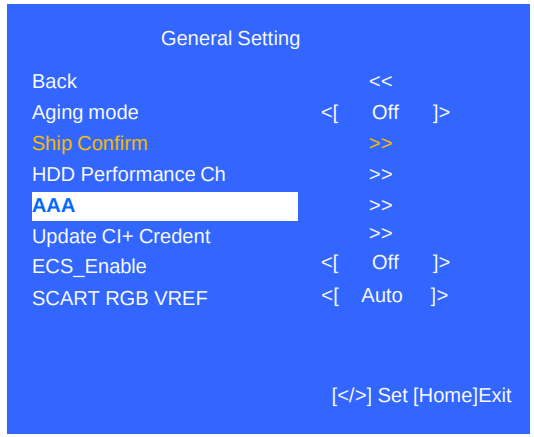
HDD Re-Register (EU only)

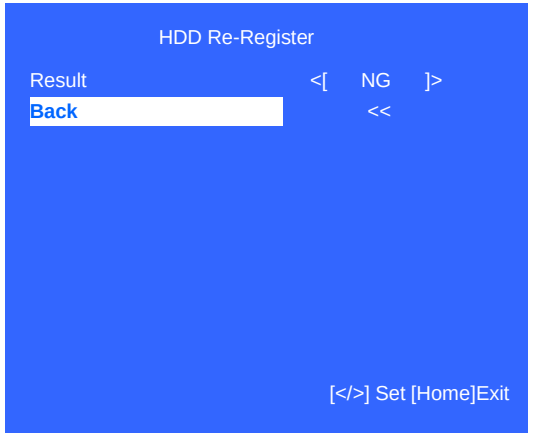
1) In “Service Mode”, select “General Setting” by pressing “↑” or “↓” then pressing “Enter” or “→” button to enter inside.

2) Select “AAA” by pressing “↑” or “↓” then pressing “Enter” or “→” button to enter inside.

3) Result **OK** or **NG** will be displayed after HDD re-registration is succeed/failed







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How to USB update

Caution:
Do not power off while the update is in progress.

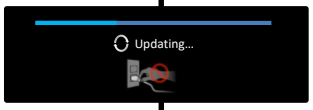
1:Download USB image and unzip file.

2: copy zip file to USB memory root folder.

3: USB memory insert TV.

4-a:USB image is newer soft version.
Automatically show message and start update.
Please follow directions.

Updating your TV software...
46%
During the software update, you can't use this TV. When the software update completes, the Illumination LED stops blinking and your TV restarts automatically. Please do not remove the USB flash drive until this blinking stops. The update takes about 10 minutes to complete. Press the BACK button on your remote control to cancel the update.



***BR/CO/LA only**
TV will reboot and enter STBY status.
Press "Power" key of remote commander to turn on TV.

5: finished

The system reboot will happen once or twice

4-b:USB image is not newer soft version.
Automatically show message.
Please follow directions.

5: finished

※ Display may change depending on the model / SW version.

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Force Factory Data Reset (FDR) by control buttons

	1 Key
Key type	**Center Key**
Model	**NX**
Procedure	1) Press and hold **Center Key**. 2) AC ON. 3) Hold the button down for several seconds until the system starts FDR.

SECTION 5
DIAGRAMS

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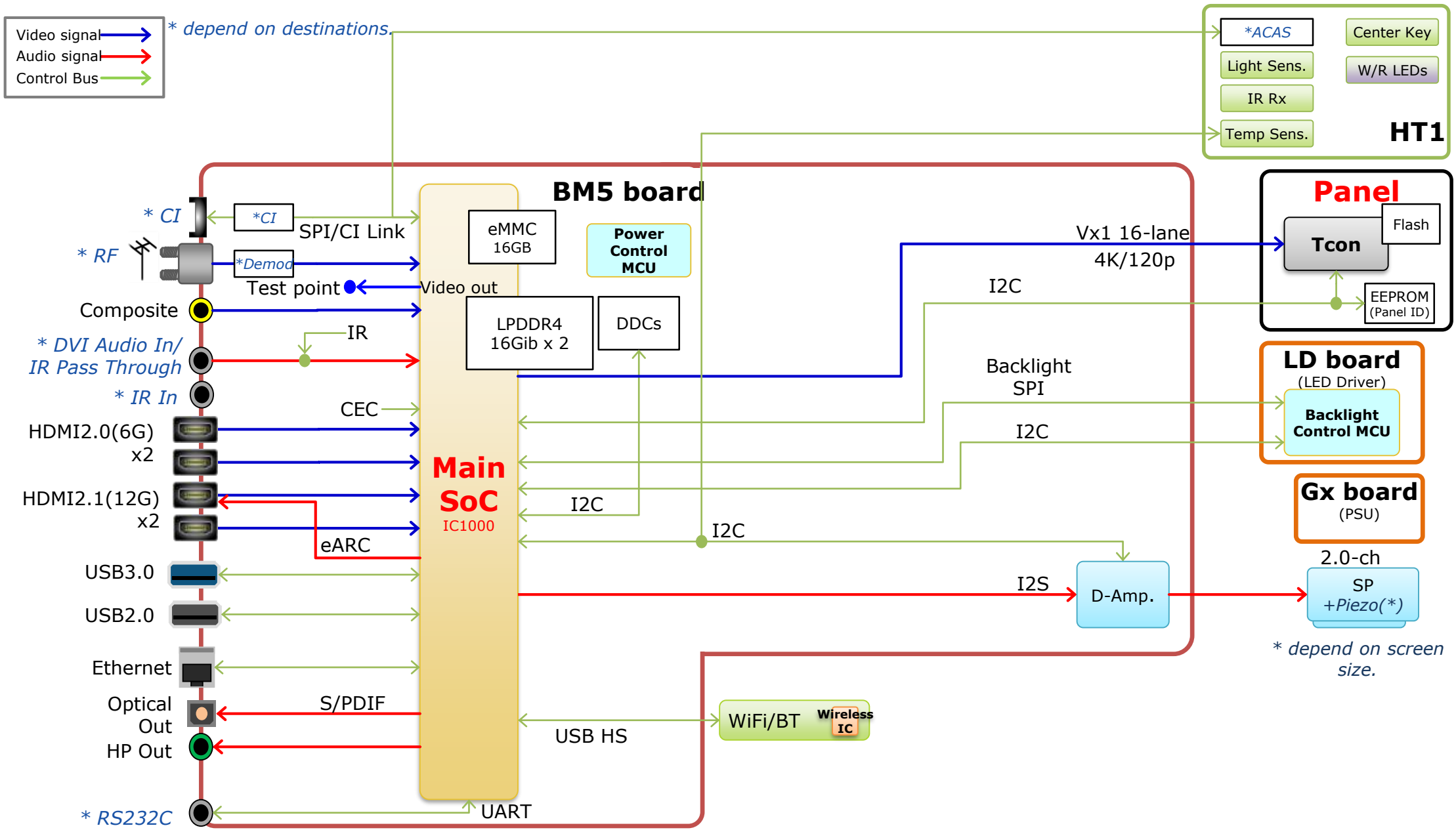
Some control lines are left out.



SECTION 5
DIAGRAMS

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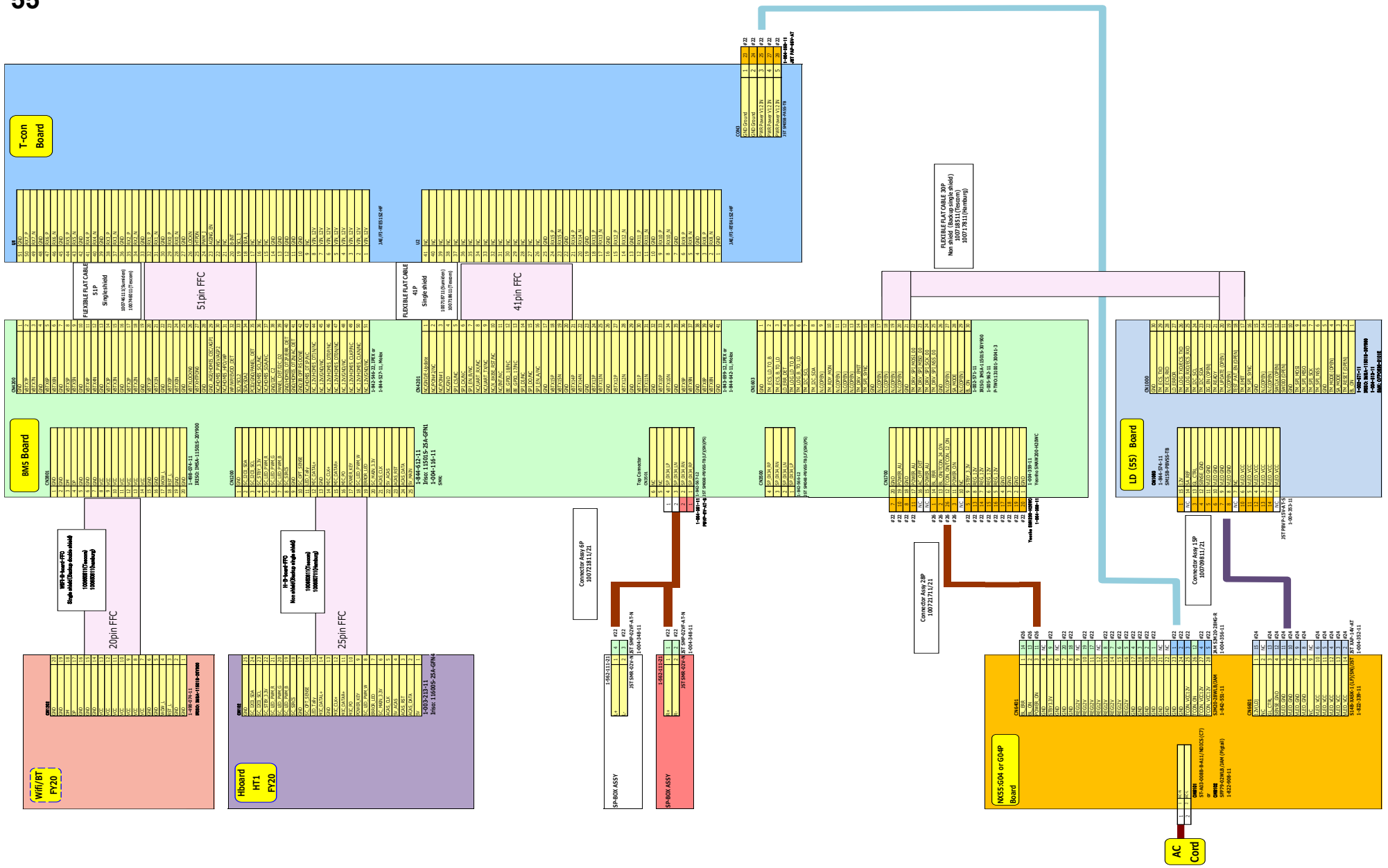
55”



SECTION 5
DIAGRAMS

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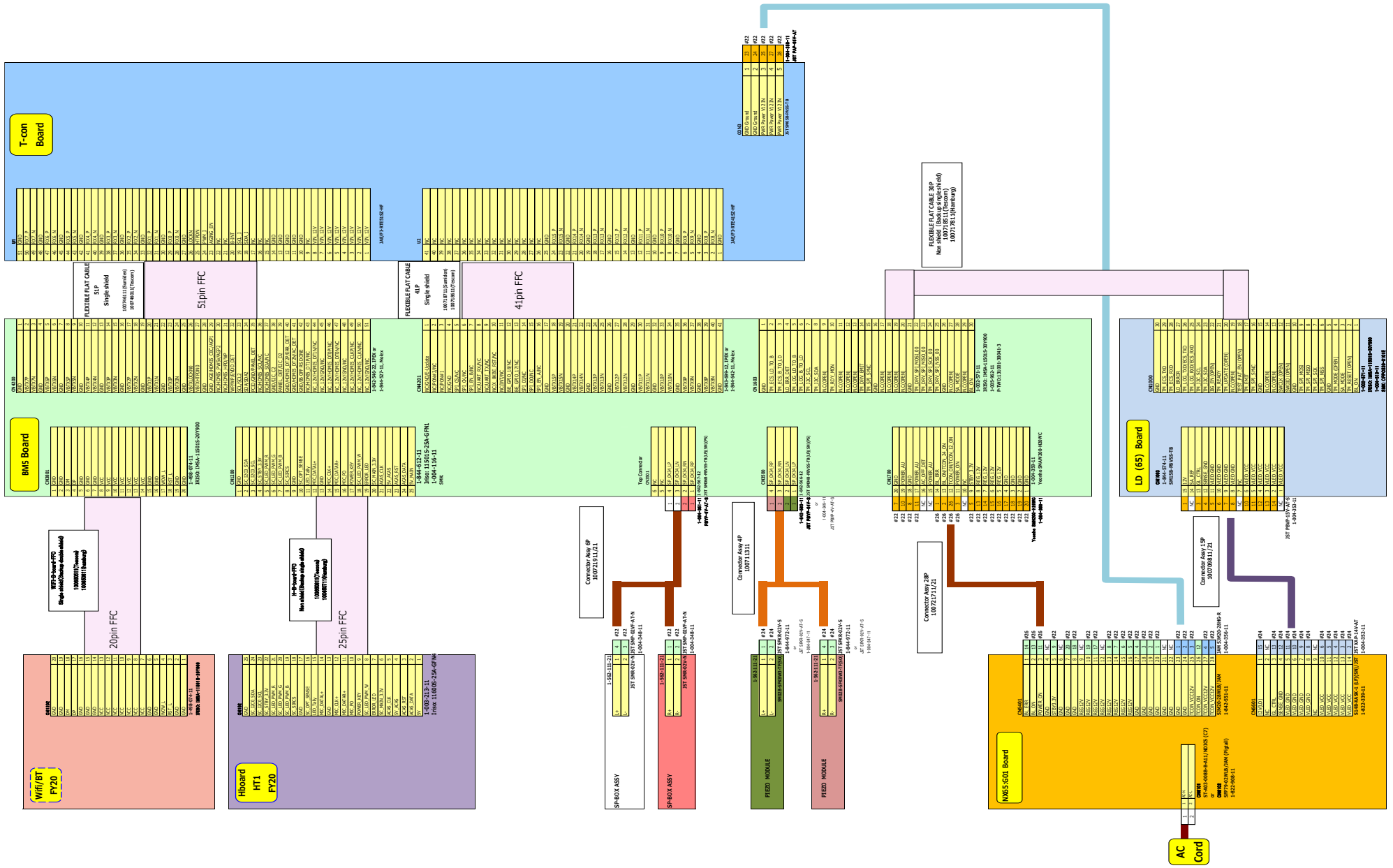
65”



SECTION 5
DIAGRAMS

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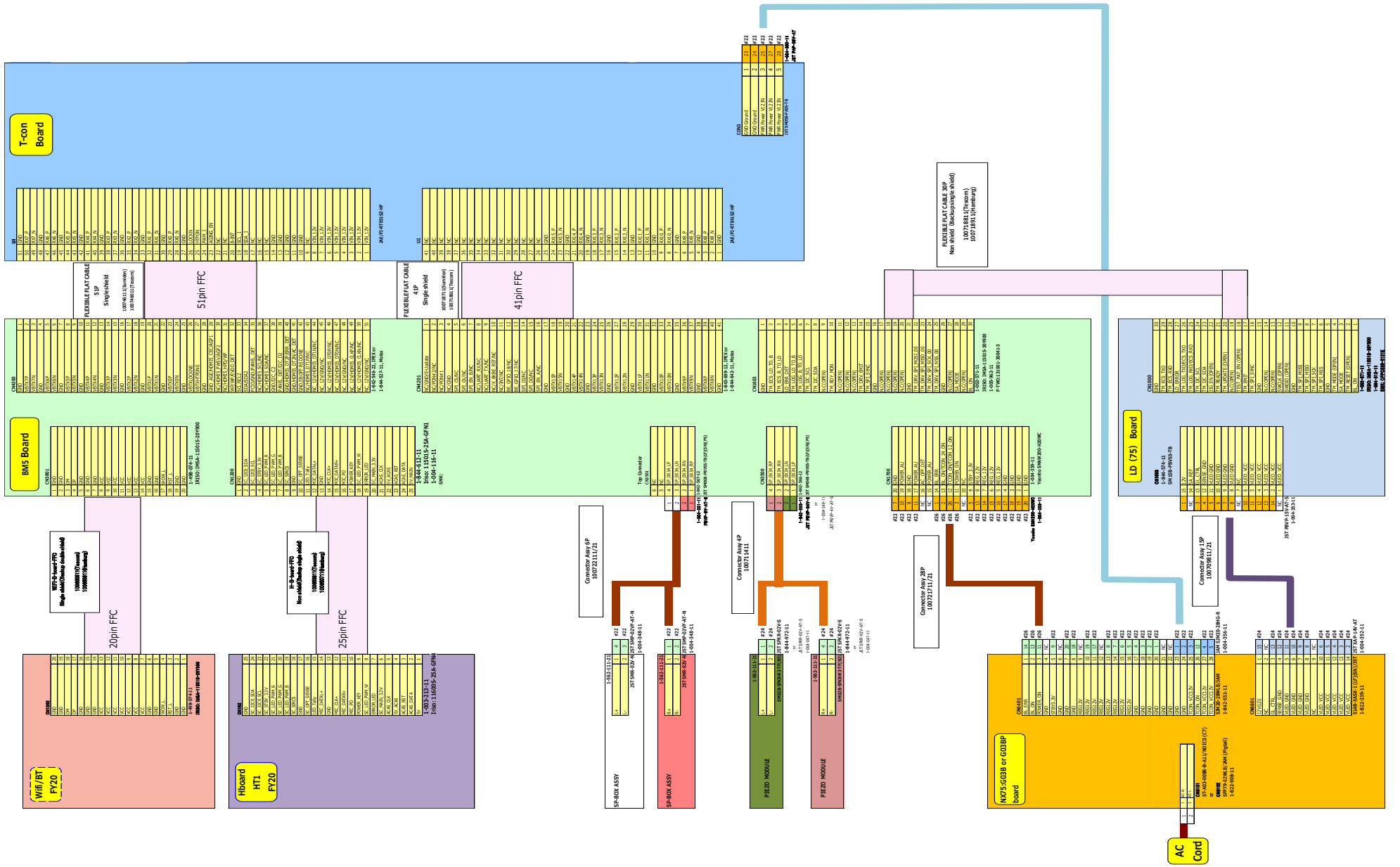
75”



SECTION 5
DIAGRAMS

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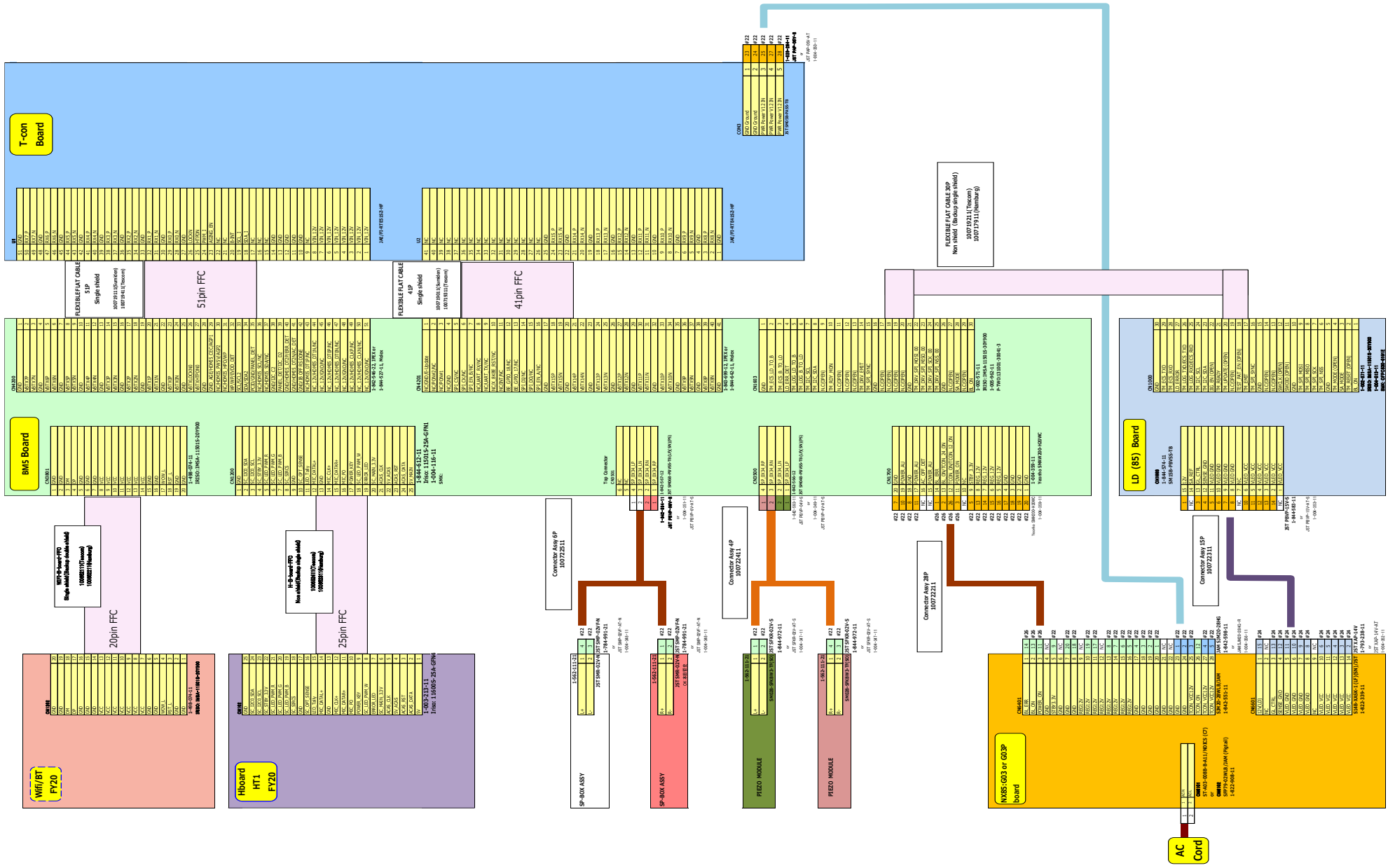
85”



SECTION 6
PANEL HANDLING

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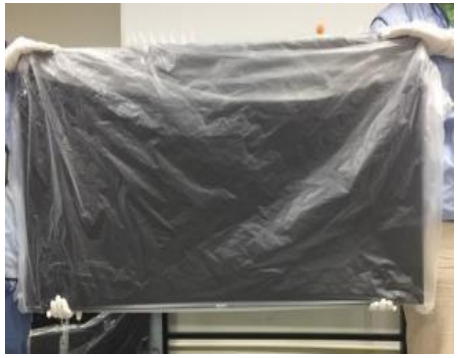
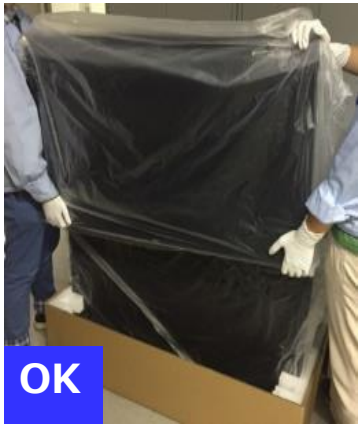
1. Un-Packing

Caution:
Does not apply when vacuum handling jig is used.

1. Take out panel from carton box by 2 operators.



2. Take out panel vertically from carton box.
And do not hit other panel.



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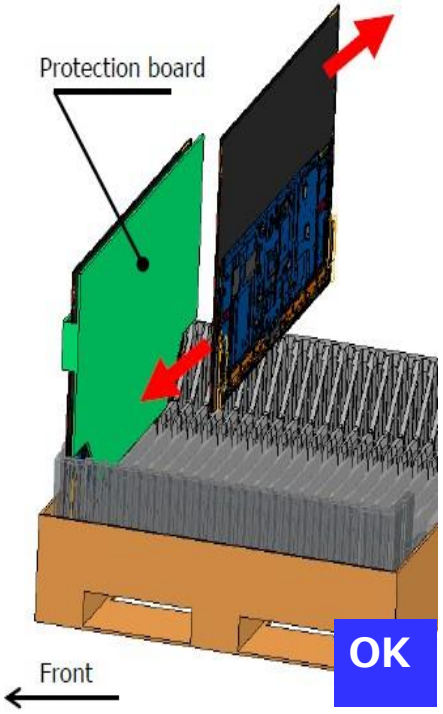
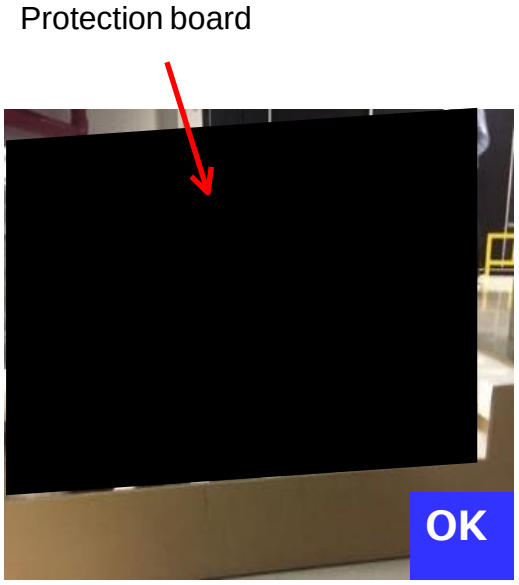
1. Un-Packing

3. Please make protection for remaining modules to avoid abnormal hitting when take out modules.

Example:





Front view

Side view

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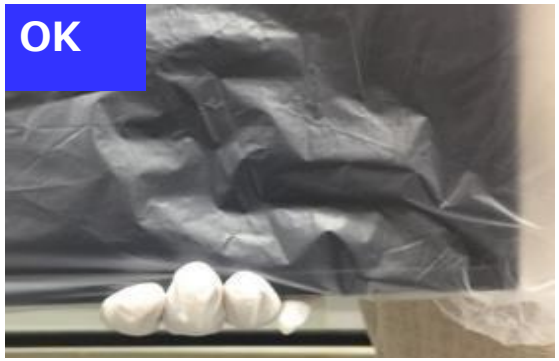
1. Un-Packing

Caution:
Does not apply when vacuum handling jig is used.

4. Do not hold or press O-Cell.



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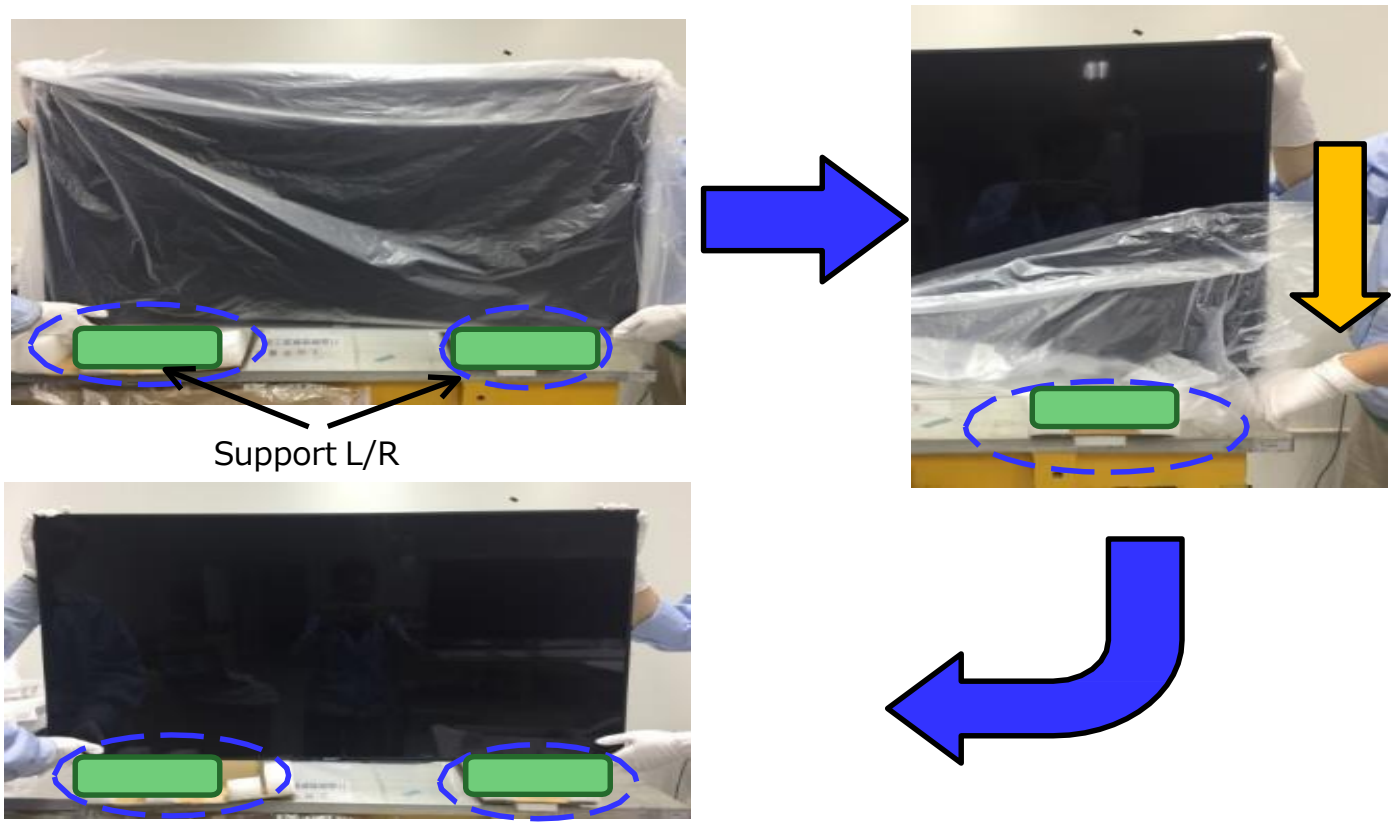
1. Un-Packing

Caution:
Does not apply when vacuum handling jig is used.

5. Put on to table & remove the protection bag.
Caution: To avoid hitting the center area of bottom AL frame for smart core Support L/R must be used!



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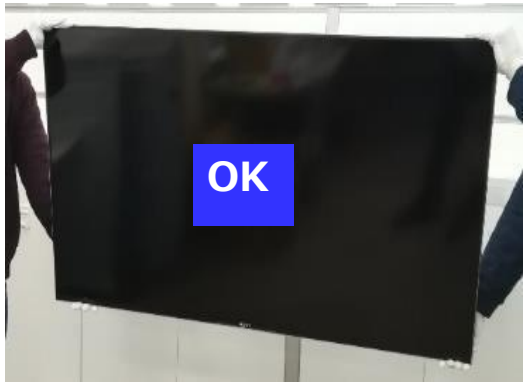
2. Carrying

Caution:
Does not apply when vacuum handling jig is used.

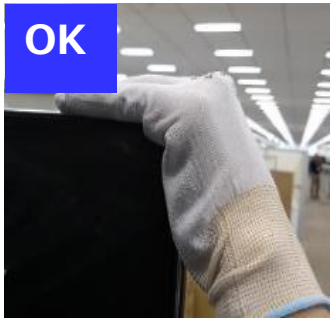
1. Carry panel vertically.

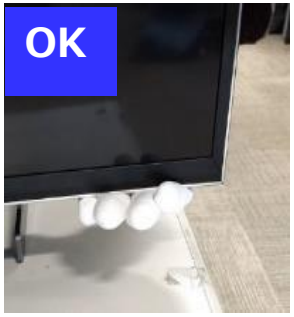


Twisting.

Horizontally.

2. Do not hold or press O-Cell.



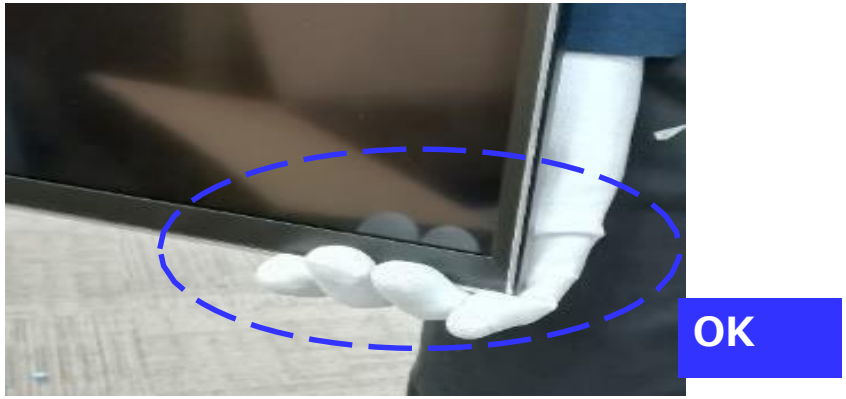


2. Carrying

Caution:
Does not apply when vacuum handling jig is used.

3. Hold panel by 2 people.

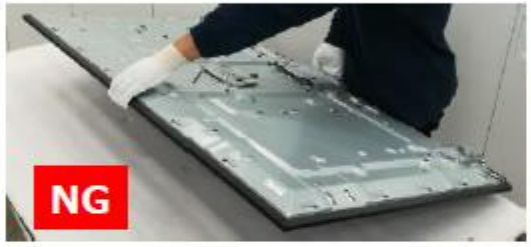
4. Do not hold the panel at the center area.



3. Placing to table

Caution:
Does not apply when vacuum handling jig is used.

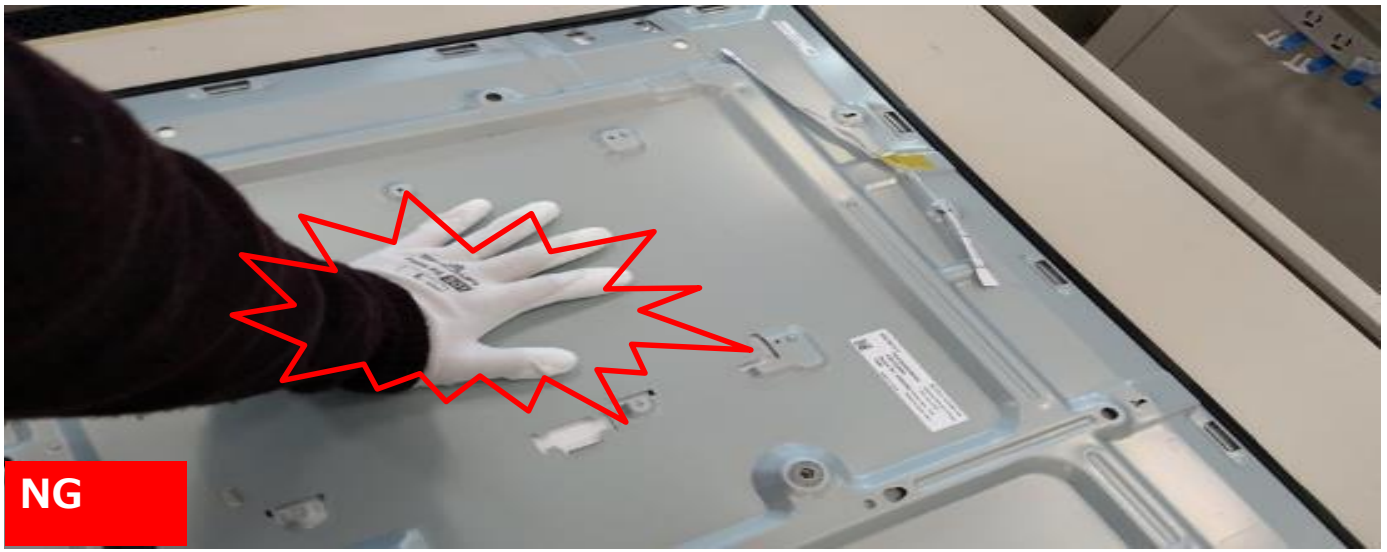
1. Put the Panel by 2 operators.



2. Put the Panel within one flat table surface.

4. Other

1. Do not press the panel during assembly and disassembly.



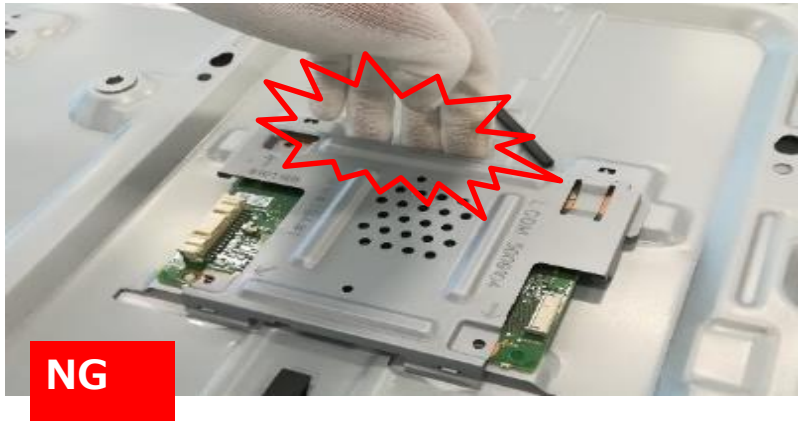
2. Do not touch Panel module without gloves.

4. Other

3. Do not grasp Source Shield.

4. Do not grasp the BC hook.

5. Do not grasp the LD Shield.



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